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Original Articles

Treatment of Foreign Bodies in the Soft Tissues

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It has been the experience of most of us to have had cases of foreign bodies, such as shrapnel, bullets, pieces of steel, needles, splints, etc., embedded in the soft tissues, come to us for removal. Ofttimes we have undertaken their removal lightly and without due preparation, with the result that we have often bungled the job and even failed to remove the foreign body. The improper handling of these cases occurs all too frequently by the family doctor and by the resident physician or intern in the receiving or accident wards of our hospitals. In fact, it is rather a rare occurrence for a patient with a splinter, or a piece of steel in hand or foot, to reach the surgeon for the first attempt at removal. Even if admitted to the hospital, the case is considered a minor one, which it really is if properly handled, and is turned over to the younger men for removal. These cases are so universally bungled that the writer has undertaken to find the cause, and has discovered that although the recent war brought out much in the A. E. F. about débridement, foreign body location and removal, in few, if any, of the more common text-books on surgery can there be found any real, live, detailed description of a technique for the conduct of these cases—reason enough why our hospital interns are ignorant; they are not taught, nor can they find out from their text-books, exactly how to do a débridement or to trace the tract of a foreign body.

In civil practice a fragment of needle embedded in a woman's hand is probably encountered as frequently as any other, and can be used as well as any other for the purpose of describing the technique advanced by the writer.

Method.—On appearing for treatment, the patient, whether there is a wound of a former attempt at removal or simply the faint entrance puncture, is asked to indicate the point of entrance. The head end of a pin, cut in half, is placed on the skin at this point and fastened there by a small strip of adhesive plaster. A wooden splint taking in the forearm, hand and finger is now applied, and anteroposterior and lateral *x*-ray views are taken. The splint must be kept in place until the patient is ready for operation. This is very important, for all too often the movements of the hand and fingers result in migration of the needle. Fig. 1 shows the fallacy of being guided by the puncture wound. In this instance, not splinted, the pin fragment is at the entrance point. Note the position in the hand of the needle fragment, due to movement of the fingers. In one instance the needle had traveled from the thenar eminence as far as three inches up the forearm.

With the *x*-ray films at hand the patient is given a general anesthetic, local anesthesia in the palm not being satisfactory, and with the hand bloodless, behind a tourniquet, the incision is planned, guided as to position and depth by observing the rela-

tion of the pin marker to the buried needle. If a threaded needle has been buried and the thread is presenting through the wound, do not use it in an attempt to extract the needle, but do use it as a guide for your incision. Immediately the incision is made, the palmar fat projects into the wound. This should be gently retracted, equally on both sides, so as not to displace the wound—that is, not to draw it to one side or the other. Now by studying the film the position of the needle is determined with regard to the bony structure and the incision deepened. The inclination here is to hunt with the finger in the wound, which should not be done, as I have known this to push the object of the search fully an inch away (Fig. 2). As the scalpel is drawn across the fibrous trabeculæ, it often gives a

Fig. 1.—Shows the pin marker at the point of entrance of the needle. The needle fragment has moved down the hand—unusual, as the movement is usually toward the trunk.

metallic-like sound that will lead the unwary to insert a forceps, to find fibrous tissue and not needle in the grasp. In very recent cases the traumatized tract in the tissues may help the direction of the search, or in older cases (days) the discoloration due to oxidation will indicate the proximity of the foreign body. The tendency is for a needle to push a tendon to one side, and as a consequence will lie hidden beneath it, either lying parallel with it within its sheath or passing on through the sheath.

If the search is still unrewarded, a finger may now be gently inserted to feel for the

Fig. 2.—This needle was ultimately recovered from between the metacarpal bones, being pushed there by the searching finger.

object. Failing this, the scalpel may be used, making lateral incisions, directed across the long axis of the foreign body. This was the successful method used in one case of a needle buried three inches deep in a fat buttock. When the needle is found, traction should be made only after one end is exposed, and then in the direction of the long axis. Should success still elude and a fluoroscope is available, it should be used. Here, then, with a Kelly hemostat, pointed in the wound under a sterile cover, the needle is approached until it is touched, when it is withdrawn, or if seen to move, yet can't be grasped because of tissue interposed, the screen is removed, the wound retracted and direct search made at the point of the hemostat. This always results successfully.

In those cases in which a sewing machine needle has penetrated the nail and broken off, projecting into the pulp of the finger, a transverse incision is best used. Fig. 3 shows this very well. The needle has punctured the base of the phalanx, left its point

in the finger pulp, and the main part withdrawn by the machine—an unusual occurrence. Usually the needle breaks just below the nail.

All too frequently a spinal puncture needle is broken off in an attempt at puncture. The fragment left in the tissues usually lies extremely deep, and is frequently displaced from its entrance point by reason of the erector spinæ muscle, the trunk changing from the extreme flexed to the erect position. These cases require the most careful use of the marker, otherwise one will become hopelessly lost in the deep tense structures, possibly between the wrong spinous processes. To prevent this, place the marker over the spinous process nearest the puncture point, a provision very needful in extremely obese patients (Fig. 4).

If the needle is broken after the point is within the dura the escaped cerebrospinal fluid in the tissues will help in the search.

It is always well at the time of the search to have the tissues in the position obtaining at the time the needle, of whatever kind, is lost. This importance was very well

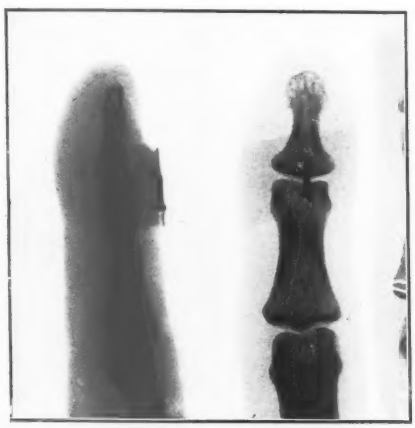

FIG. 3.—Shows the perforated phalanx and the small fragment in the finger pulp. This fragment required no surgery.

illustrated some months ago. The writer was asked to recover a hypodermic needle broken off in a patient's back during a paracentesis thoracis in the scapular line. The needle could not be located until the patient sat up, leaned forward and folded the arms, when it was recovered from a position which was beneath the scapula, now pulled forward in the primary position.

Splinters of wood driven in the finger just under the nail occur in scrub women and are grave potential dangers from the

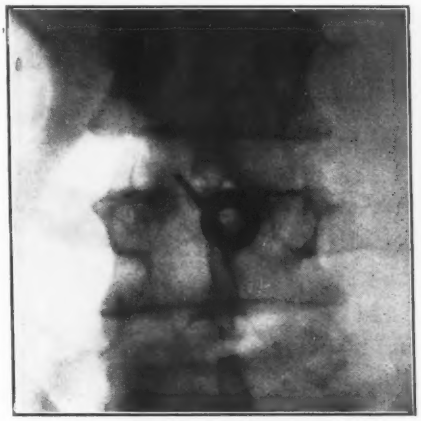

FIG. 4.—Showing a ring marker and a spinal puncture needle fragment.

standpoint of pyogenic and tetanus infection. These cases usually come to the surgeon after the patient or a physician has broken the splinter off so far beneath the nail that it cannot be grasped with a forceps. A wedge cut out of the free edge of the nail just over the splinter will allow it to be grasped and gently extracted (Fig. 5).

Should suspicion be strongly directed against infection the nail may be sectioned and the strip that forms the roof of the gutter wound be removed (dotted line, Fig. 5) for better drainage. Tetanus antitoxin is always administered.

There are many cases of pieces of metal and minute needle points, bullets, glass, etc., which become buried in the tissues and will never cause any inconvenience, provided they are not lodged in a position to cause pain from their relation to a nerve or joint (Fig. 6). Should, however, the foreign body give trouble, it must be removed, and any injury, as for example nerve, be repaired. Should the case come for treatment when the wound is still fresh, the tract will direct the operator to the foreign

body. In any event two *x*-ray views at right angles to each other should be taken and the position of the object indelibly marked on the surface. Where the lines dropped from these points cross, indicates the position of the foreign body (Fig. 7).

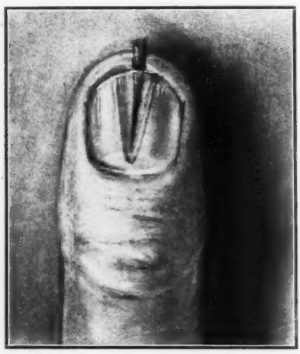

FIG. 5.—Splinter under the nail and the wedge-shaped gutter necessary for drainage at times.

If the wounds are clean-cut punctures with no destructive trauma to deep structures, the foreign body may well be left *in situ*. Should the wound be due to a tumbling bullet, a soft-nosed bullet, or a rough fragment of metal, it should be opened at the earliest possible moment and a thorough surgical removal (débridement) of all devitalized tissue in the wound as well as the foreign body, if still in the tissues.

This treatment was carried out most carefully and universally in the recent war, and at that time many writers—Pool, Deneen, Lee, Lemaitre, Depage, *et al.*—published admirable articles on the subject. Despite the fact that this method of lacerated wound treatment is not only applicable but is the method of choice as well in civil life injuries, nevertheless the literature has contained but little and the text-books less of the actual technique employed. The operation of débridement is a real one requiring a knowledge of anatomy presented in varied and unusual approaches very often never used in other surgical procedures. It is too often improperly performed by many who attempt it to-day. A débridement is a refined surgical procedure and not a haphazard piece of hack work. No wound in which there is evidence of pus should be débrided.

Technique.—The incision should be planned so as to lie in the direction of the long axis of the limb, or in the case of the hand or trunk to conform to the important nerve, vessel, and muscle line. It must be long enough to allow of suffi-

FIG. 6 A.—A small piece of steel 2 x 3 mm. necessitating operation to repair a severed ulnar nerve.

cient exposure. A good working rule is to have the skin wound twice as long as the depth to which the operator expects to go. If the foreign body has passed through the

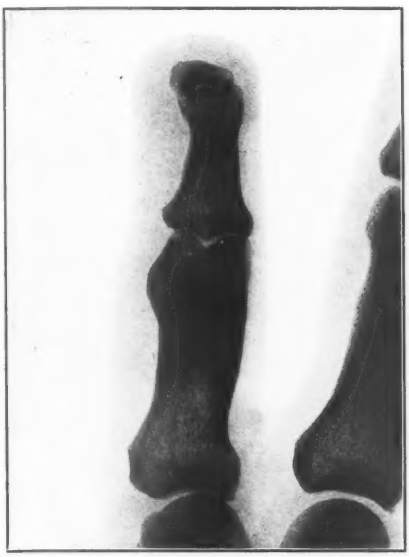

FIG. 6 B.—A bullet that required no surgery.

part, or lies in such position that it can be approached to better advantage from the opposite side, a second incision is made. This is often advisable by reason of proximity to the opposite surface, relation to important structures, or undue depth. When two incisions are employed, they should be placed so as to form a Z (Fig. 8), with the line of the wound connecting them. This allows the best possible working room. Transverse incisions are not advisable except on rare occasions when the wound is superficial or when the transverse destruction has been severe. Transverse muscle wounds tend to heal poorly and to give poorer ultimate function. Place the incision as shown in Fig. 8, excising the traumatized skin by a small ellipse.

The skin wound is now retracted and the underlying fascia or aponeurosis is slit with a knife or sharp scissors by sliding the opened blades in the cleavage line direction above and below the tract (Fig. 9). This layer is rolled out until the tract is exposed in the next lower tissue level. Only then is the more superficial landmark of traumatized tissue excised. By adhering to this rule of never obliterating the tract until it is exposed deeper in, one runs less risk of losing the way and wandering afield after the traumatized tract which may apparently suddenly end among muscle bundles. This may be due to uneven pull on retractors, which should be blunt, or more often to the fact that the wound occurred with the various muscles in a different relative position than exists on the operating table (Fig. 7). It is therefore well to obtain from the patient beforehand information of his posture at the time of the accident. The placing of the part in this position will often reveal the further course of the missile. Ofttimes a lacerated group of muscle fibers will retract farther than those around it, forming a hidden pocket. This must be traced and the injured end excised. A lacerated tendon will result in a retraction of the proximal end, especially noticed in the wrist and hand. Flexion of the elbow and a milking motion from the elbow toward the wound, or the application of successive turns of an elastic bandage starting below the elbow and overlapping toward

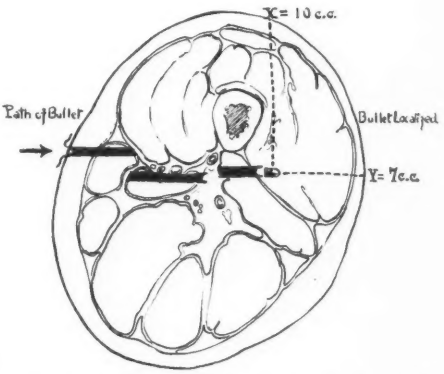

FIG. 7.—A cross-section of a thigh. The dotted lines show the position of the f. b. indicated by the *x*-ray. The broken black line illustrates the change in the bullet tract due to change in muscle position.

the injury, will frequently cause the retracted flexor tendon to present in the wound. All injured tissue should be excised by sharp scissors, preferably with comparatively short curved blades. Muscle

that has lost its contractility must be sacrificed regardless of amount or position until fibers are encountered that bleed and twitch when cut. However, in making the exposure incisions in muscle above and below

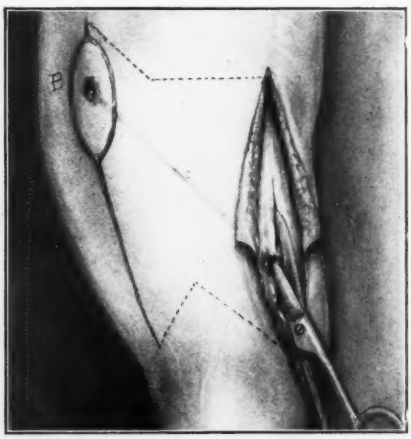

FIG. 8.—Illustrates the incisions in long axis of the limb parallel and planed to form a Z with the bullet tract. The dotted lines show the cone shape the operative field should assume. The débrided tract corresponds in size and shape to the ellipse B—excision tract, C.

the tract, the pushed scissors with the open blades follow the muscle bundles best. Separate, rather than cut, muscle fibers whenever possible. Torn fascia, bruised fat and lacerated veins are all sacrificed. Extravasated blood-stain reaching afar along tissue planes should be ignored. Detached bone fragments are removed and the bone edge mechanically cleansed with some sharp instrument—curette, chisel, or saw. Important nerves and vessels and vital obstructions are preserved if intact; if injured, a resection may be necessary. One should endeavor to carry the same plan of tissue excision throughout the wound as is outlined upon the skin (Fig. 8). In other words, a small ellipse removes the dead tissue; the lengthened, retracted incision merely permits of exposure and naturally needs no débridement. The succeeding incisions are gradually shortened so as to form an elliptical cone with its apex at the depth of the trauma tract. In the case of through-and-through wounds, these operative truncated cones of the entrance and exit wounds meet at their apices (Fig. 8).

Throughout the operation oozing from the walls is best controlled by placing gauze pads beneath the retractors. This procedure at the same time protects the clean débrided wound from repeated contamination during the work on the dirty parts lying deeper. If the tract is permanently lost and the foreign body cannot be found, the fluoroscope may be used. With a hemostat in the wound search is made under the eye. The proper depth of the hemostat is determined by shifting the *x*-ray tube below. When the foreign body shadow and

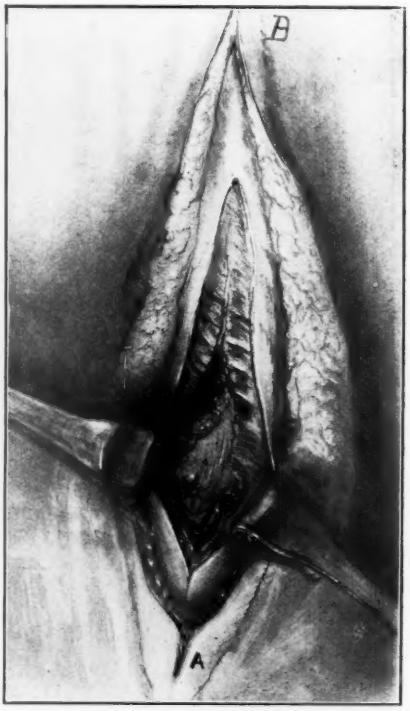

FIG. 9.—Illustrates the wound layer by layer, showing the traumatized tract in the lower layers in view before your landmark in the upper layer is destroyed. In long deep wounds this is very important. The tract of this bullet was directed toward B.

the hemostat point shadow move absolutely together, neither separating nor approaching, they are on the same level. If the shadows are then superimposed, the objects must be in juxtaposition.

If the case has been operated within the contamination period, a thorough excision done and satisfactory hemostasis obtained,

it may be closed primarily; otherwise the wound should be left open, dressed with gauze, laid on loosely, and the limb placed in the position that relaxes the muscles favoring the gaping of the wound. To accomplish this gaping, in external thigh wound, a short transverse incision of the fascia lata is necessary in those cases infected with the bacillus aerogenes capsulatus.

Some Modern Concepts of Nutritional Disorders[1]

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The science of nutrition has made rapid strides within recent years, and to-day the disorders of nutrition claim the close attention of every practicing physician. Our present-day knowledge is the result of information gained from human observation and animal experimentation, both of which have been aided greatly by the advancement of chemistry.

The time allotted for this presentation will not allow me to trace the interesting development of our modern concepts of nutritional disorders, nor to discuss in an academic way debatable factors upon which some of the concepts are based. I shall not even touch upon many interesting groups of experiments, but I shall restrict my remarks to those human observations and experimental studies which have a direct bearing on the practical problems of nutritional disturbance. Furthermore, I shall discuss only briefly the several uncommon disorders and lay more stress upon the two common conditions, rickets and scurvy. At the suggestion of your President, I shall also include a few remarks in regard to the treatment of diabetes.

Scurvy—Clinical Aspects.—In its fully developed form scurvy presents no great problem in diagnosis. It should be suspected in artificially fed infants and breast-fed infants where the mother is undernourished. It also occurs in the adult. The disease is usually insidious in onset and characterized by anorexia, increasing pallor, weakness, sweating, restlessness, and irritability. The examination of the mouth at this time may reveal swollen and red gums which are tender and bleed easily. The gums, however, may be normal, and since there is nothing characteristic in the above symptoms suggesting scurvy, its presence may not be suspected until the sudden appearance of pseudo-palsy in one or more of the extremities. Comby calls attention to what we all know, but frequently forget, namely, that when an infant keeps its limbs still and cries if it is touched, we ought to suspect scurvy. The pseudo-paralysis is due to the hemorrhage in the region of the epiphysis causing the periosteum to be raised. Any epiphysis in the body may be the site of the hemorrhage. Hemarthrosis may occur. Hemorrhages in the skin or subcutaneous tissues and from the mucous membranes are common. Melena may be an early symptom. In one case which I saw scurvy had not been suspected until a subperiosteal orbital hemorrhage produced a proptosis, for which the child was admitted to the eye wards of a large hospital. In this connection it is interesting to note that Zilva and Still *(Lancet,* 1920, cxcviii, 1102) report orbital hemorrhage as occurring in six among 64 cases of scurvy. In five of these the proptosis was limited to the left eye.

There is a curious, firm, brownish, and blood-stained induration of the skin and underlying tissues of the legs which develops in some cases, and to which the name "scurvy sclerosis" has been given. Fever

[1]Read before the Warren County Medical Society, Washington, N. J., April 9, 1924.

may or may not be present. It is usually absent in the adult except in the later stages. In the adult headache, mental depression, delirium, convulsions, hemiplegia, etc., may occur. The blood examination reveals an anemia of varying severity without leucocytosis.

Porter and Carter *(California State Journal of Medicine,* 1919, xvii, 431) point out that most of the cases coming to their clinic are undiagnosed, suggesting that the less evident subacute cases are frequently overlooked. It often happens that the child is irritable, especially when moved. There may be a history of easy bruising with hemorrhagic spots perhaps somewhere on the body. An unexplained hematuria or melena may be the only manifestation. It is well to keep in mind, as Porter and Carter pointed out, that the disinclination to move the legs may be a symptom of cystitis, which is not uncommon in female infants. The rarity of rheumatic fever, the history and concomitant symptoms in lues, the limitation of sarcoma to a single bone, the aid given by the *x*-ray, and the prompt disappearance of scurvy manifestations when antiscorbutic foods are added to the dietary, render the diagnosis of scurvy, as a rule, reasonably easy when its possibility is kept in mind.

Etiologically, scurvy is essentially a deficiency disease. There is no etiological difference between the scurvy seen in adults and that of infants. It develops on a diet in which there is a lack of the antiscorbutic vitamin. This substance is abundant in fresh vegetables, germinating cereals, fresh fruit juices, and fresh cow's milk. Scurvy develops when these substances are absent from the diet. Hess *(New York State Medical Journal,* 1920, xx, 209) lauds the value of canned tomatoes as an antiscorbutic. In artificially fed infants it can be given in doses of one ounce a day. It is palatable, well borne, readily available, and comparatively inexpensive as compared to orange juice. An unhygienic environment predisposes to the development of scurvy. It is obvious, therefore, that in the prevention and treatment of scurvy the dietetic and environmental defects must be corrected.

Scurvy is rare among breast-fed infants. However, Wilkinson *(British Medical Journal,* 1921, April, 583) reports its occurrence in a purely breast-fed child where the mother lived largely on pickles, vinegar, and bread. The child rapidly recovered following correction of the mother's diet. Two other instances of scurvy in breast-fed infants are reported by Tupas *(Philippine Islands Medical Journal,* 1921, 1, 23): one was an infant of one month and the other two months; both recovered after lemon juice was added to the diet. Faber *(American Journal of Diseases of Children,* 1921, xxi, 40) reports a case of infantile scurvy following the use of raw certified milk from birth. He suspects that the sodium citrate added to the milk may have been responsible for the destruction of the antiscorbutic vitamin.

Rickets.—Rickets usually appears in infancy between the ages of six months and two years. Dunham *(American Journal Diseases of Children,* 1923, August, 155) reports rickets occurring in an infant of thirty-four days. Although rickets is essentially a disease of early childhood, it may not develop until the fifth or sixth year, or later. This so-called rickets-tarda was quite prevalent in Europe during and after the war. There are few diseases more prevalent in the temperate zone than rickets. Some students of the disease have estimated that 75 per cent of all children in the temperate zone have had rickets. There is no disease having so low a mortality *per se* which at the same time exerts such a large indirect lethal influence. The child with rickets is prone to measles, bronchopneumonia, tuberculosis, etc. Respiratory infections of all types are common in rachitic children. Later in life the skeletal changes are menaces to life; for example, the deformity of the pelvis in females, which gives rise to varying difficulties of labor.

Clinical Aspects.—In considering the clinical manifestations of rickets it is well to recall that while the bones show the most striking features of the disease, the organ-

ism as a whole is involved. Its onset is insidious. It should be suspected whenever there are evidences of retarded development, when the fontanelles are late in closing, when the child is slow in sitting or walking, when the teeth are tardy in eruption, and when the child is peevish, irritable, weak, and disinclined to move. Not uncommonly there is slight fever, perspiration about the forehead, and a rolling of the head from side to side, which sometimes results in local loss of hair. Digestive disturbances are common and constipation is an early and obstinate feature; later diarrhea may occur. As the disease develops there is progressive pallor and weakness. The disinclination to move the extremities suggests paralysis (pseudo-paralysis of rickets) and is due to muscular weakness and pain. The bony changes involving the head, spine, thorax, and extremities are familiar to you. The prominence of the abdomen and enlargement of the spleen are common findings in advanced rickets. Tetany occurs in those cases in which the calcium content of the body is reduced. I shall refer to this again. Laryngismus stridulus is a not uncommon complication. Convulsions may occur.

Rickets, like scurvy, presents no great problem in diagnosis when present in its fully developed form. In the atypical forms the disease is often overlooked. With ordinary care it should not be confused with infantile paralysis, spinal caries, or hydrocephalus, to which it may present some superficial resemblances.

Etiology.—Heredity, diet, environment, and infection have been variously blamed for the development of rickets. It is common among the poor, bottle-fed, and in the winter and spring. It is said to be absent among inhabitants of the Hebrides Islands, where, although the hygienic conditions are intolerable, the food consists of cods' heads, cod liver, fish, milk, etc.; foods which we now know to be rich in the antirachitic substance. Rickets is said to be absent among the Eskimos, Icelanders, Laplanders; and the same reason is given in explanation.

The Glasgow School of Investigators has stressed the importance of environment in the etiology of rickets. Lack of fresh air, lack of exercise, crowding, and infection are considered by them as the important determining factors. Findlay *(British Medical Journal,* 1922, November, 487), of the Glasgow School, quotes as opposing the dietetic factor the observations of Hutchinson *(Quarterly Journal of Medicine,* 1922, January, 167) in India. Hutchinson found in Nasik in India two social classes, the poor laborer and agriculturist who live an open-air life, and the wealthy Hindus and Mohammedans whose female and infant population are confined to dark and ill-ventilated homes. The infants of both classes are breast-fed for one to two years; the general diet of the poor is defective in animal fat as compared to the wealthy classes, who consume meat, vegetables, milk, and eggs, recognized sources of the antirachitic substance. Yet it was in the better class that Hutchinson found not only early but late rickets prevalent; the poorer class being relatively immune.

A very important study of the etiology of rickets has recently been reported by Chick (Medical Research Council, Special Report, No. 77, London, 1923; *British Medical Journal,* 1923, June, 987) and her colleagues from Vienna. Seventy infants were observed for long periods between November, 1920, and July, 1922. When admitted to the hospital they were free from rickets. One-half were given a diet (Diet I) consisting of fresh undiluted cow's milk, sterilized and supplemented by large amounts of cane-sugar; and in older infants cooked starch was added, as semolina and potato. The other half of the children were given Diet II, consisting of full-cream-dried milk, reconstituted by the addition of water, sugar, semolina, and potato. Every infant on Diet II received a daily ration of one and a half teaspoonfuls of cod-liver oil. The development of rickets took place as follows: Where the standard of diagnosis was the radiograph, 17 cases occurred in Group I and no cases in Group II. All of the cases of rickets occurred between December 30 and May 2. Thus

under similar and good conditions of hygiene in well-lit and airy hospital wards, a marked tendency to rickets was shown by children on a special diet, but only during the winter season; the conditions of life in summer, the free exposure to sun and open air, neutralized the rachitic influence of diet. The rickets which occurred in the infants on Diet I was curable by cod-liver oil, or by exposure to sunlight (out-of-doors), or by the mercury vapor quartz lamp. The treatment by sunlight was on the whole more efficacious than the mercury vapor lamp or cod-liver oil; but there was an impression that the addition of cod-liver oil to open-air treatment accelerated cure.

These human observations tally with many and varied animal experiments. The animal experiments have increased our knowledge of the bone lesion of rickets and the altered chemical changes which occur in the body and in the bones. In health the growth and repair of bone are orderly processes. In rickets the process is disorderly, osteoid tissue is produced in excess, calcification is deficient, the bones become irregularly enlarged and their weakness is evident by bowing and fracture. Now, while rickets may result from a deficiency of calcium or phosphorus in the diet, McCollum, Simmonds, Shipley, and Park found that the *ratio* between the concentration of these two substances is more important than their absolute amounts. The phosphorus is seemingly the more important factor because rickets can be produced by phosphorus deficiency, even when calcium is present in excess.

Howland and Kramer *(American Journal of Diseases of Children,* 1921, xxii, 105), studying the calcium and phosphorus content of the blood of normal and rachitic children, found that phosphorus varies greatly. When calcium is reduced in rickets tetany usually occurs. When, with normal calcium values and low phosphorus content in rickets, cod-liver oil is given or exposure to sunlight occurs, the phosphorus content at once rises to normal or above. McCollum and his coworkers believe that the heightened concentration of phosphorus in the serum may be the cause of the resumption of calcium deposition in the bones. Hess and Lundagen *(Journal of the American Medical Association,* 1922, lxxix, 2210), studying the seasonal variation of the blood phosphates, found it corresponded with seasonal incidence of rickets, which in turn is related to seasonal opportunity for direct sunlight exposures. Clinically there are two kinds of rickets: one associated with low blood calcium in which tetany may occur, and the other associated with low phosphorus. In the prevention and treatment of rickets sunlight (outdoor life) is of first importance. Secondly, and of no less importance, is attention to the diet, especially with regard to its content of the antirachitic substance and of calcium. Since cod-liver oil, eggs, etc., are rich in the antirachitic substance, the value of these foods is obvious.

The Antirachitic Substance and Fat Soluble A Vitamin.—These two hypothetical substances are not identical. McCollum, Simmonds, Shipley, and Becker *(Johns Hopkins Hospital Bulletin,* 1922, xxxiii, 229) showed that oxidizing cod-liver oil which destroys fat soluble A vitamin does not destroy the antirachitic substance. Human observations and laboratory investigations recall that a diet deficient in fat soluble A vitamin does not give rise to rickets, but to an eye condition which is spoken of as xerophthalmia or keratomalacia. In animals on a diet deficient in fat soluble A, Yudkin and Lambert *(Society of Experimental Biology and Medicine,* 1922, xix, No. 8, and *Journal of the American Medical Association,* 1922, lxxix, 2206) point out that eye changes start in the lids and then extend to the cornea. At first a watery discharge occurs which later becomes serosanguinous and somewhat viscid. The cornea becomes secondarily involved in an ulcerative keratitis eventuating in keratomalacia. Yudkin states that the experimental picture is like the condition known as xerosis of the conjunctiva and cornea in man, and the more advanced picture is that of keratomalacia. Ross *(American Journal of Diseases of Children,* September, 1921)

reports four cases of nutritional keratomalacia in children fed almost exclusively on condensed milk, a food high in carbohydrate value, relatively low in fat and protein, and deficient in the fat soluble A factor. The eye lesion is usually an indication that the nutritional disturbance is far advanced. Three of Ross's patients died, two of pneumonia. Block *(Journal of Hygiene,* 1921, xix, 283) found in Denmark in 1917, where under the influence of Hindhede, fat was considered a dispensable foodstuff, that numerous children grew to be weaklings, without appetites, under height and under weight for their ages, and they developed xerophthalmia. These conditions were cured by rationing butter and selling it to the poor at low prices. Administration of whole milk and cod-liver oil was also effective. Ten grammes of cod-liver oil, given twice daily, cured xerophthalmia in eight days except in cases in which its administration had been too long delayed to save the eyesight. Lusk *(Physiological Reviews,* 1921, I, 523) states that one can hardly cite a more clear-cut example of the benefits conferred upon a people from knowledge of experimental biological science.

Mori in Japan reports the occurrence of this eye disease in Japanese children between two and five years of age who subsist on a diet of rice, barley, cereals, and green vegetables. Prompt relief of the eye symptoms was observed when cod-liver oil was added to the diet.

Fat soluble A vitamin is found in butter, cream, cod-liver oil, beef fat, the various meats, whole milk, egg yolk, leafy vegetables. It is absent in olive oil, cotton-seed oil, white fish, skimmed milk, white wheat flour, polished rice, fruit juices, etc.

Pellagra was formerly thought to be limited to the southern part of the United States. An increasing knowledge of this disease reveals that sporadic cases may occur anywhere, and in individuals irrespective of age, race, or social condition. The possibility of its occurrence should be kept in mind in lunatic asylums, especially. Shattuck *(Boston Medical and Surgical Journal,* 1923, January, 110) recently found hospital records of 136 cases in Massachusetts. Roberts *(Journal of the American Medical Association,* 1920, lxxv, 21) estimated that there have been 500,000 cases with 50,000 deaths from pellagra in the United States from 1902 to 1920. He points out that pellagra is decreasing in severity, and in its present-day mild form may be missed. He describes a type, for example, which he calls pellagra in multipara. A mother of several children, doing a great deal of hard work, with no vacation or servants, suffering from perineal laceration, constipation, visceroptosis, loss of appetite, and a none too varied or appetizing diet, is a pellagrous candidate. Flurries of diarrhea, loss of subcutaneous fat, pinkish face and hands, roughened elbows and knees, raw tongue with a red tip, weakness, low blood-pressure and rising pulse, but no definite or typical eruption (pellagra sine pellagra), is a common atypical picture of pellagra.

Roberts points out that the acute typhoid form of pellagra is becoming rare, the typical dermatitis less common, the forms of pellagra without dermatitis more common, and mild cases with the possibility of cure increasingly frequent.

Time will not permit a detailed discussion of the clinical manifestations of pellagra. In typical cases the alliterative symptoms—dermatitis, diarrhea, delirium, and death—dominate the picture, but there are many variations. The skin lesions are symmetrical and involve the exposed parts as a rule, but may, as Goldberger and his associates pointed out, start in the scrotum. Stomatitis is common, and the pellagra tongue is bright-red on the edges and tip; the papillæ are prominent. Burning in the mouth with salivation are common. Anorexia, digestive disturbances, and diarrhea occur, with progressive weakness and wasting. Mental symptoms, delirium, melancholia, tremors, etc., occur. The various symptoms occur and recur in the spring.

The etiology of pellagra remains unsettled. Goldberger *(Public Health Reports,*

1920, xxxv, 648, and 1922, xxxvii, 462) and his associates consider that the weight of evidence is in favor of a faulty protein (amino acid) supply as the primary etiological factor, although at the same time they recognize that some as yet unrecognized dietary factor, possibly a vitamin, may be concerned either alone or in combination with the amino acid factor. Goldberger and Wheeler *(Archives Internal Medicine*, 1920, xxv, 451) conducted observations on the diet relationship to pellagra among convict volunteers at the Mississippi State Penitentiary. A diet was supplied which was principally cereal in character and like that which these observers had noted in other studies to be associated with a high incidence of the disease. Pellagra developed in six of the eleven volunteers.

In the *prevention and treatment of pellagra* the essential feature is the correction of the faulty diet. The inclusion of milk, meats, eggs, and leafy vegetables in the diet supplies the necessary antipellagrous substances. I cannot refrain quoting from McCollum's book on nutrition (The Newer Knowledge of Nutrition, 1922, Second Edition, 290) not merely because of the reference to the treatment of pellagra, but because of a broader reference to a menacing feature of present-day food supply. McCollum states that "pellagra afflicts the people of the South largely because they are engaged in the cultivation of a cash crop (cotton), or in its manufacture. Under such conditions the food supply is derived in great measure throughout the year from the grocery store, and during the winter season, practically exclusively so. The grocer, in modern civilized and progressive communities, has come in recent times to restrict his line of foods in great measure to milled cereals and canned goods which are derived either from muscle meats or from seed products (beans, peas, corn, etc.) and molasses. As has been repeatedly shown by experiments on animals, it is not possible to prepare from such a list of foods a diet which will promote well-being over any prolonged period. On such a diet ill health and insufficiency are to be expected, and experience has abundantly shown that this result is being realized where such dietary practices prevail.

"The knowledge of the methods by means of which pellagra can be eradicated is, therefore, quite adequate, and as soon as it can be applied practically where needed the disease may confidently be expected to disappear in proportion to the extent to which reform in the diet of the population can be brought about. The reduction of the consumption of milled cereal products, molasses, and fats, and a substitution of liberal amounts of the protective foods, milk and the leafy vegetables, will free any community from this scourge, which is now (1921) reported to afflict more than two hundred thousand people in the United States."

Carotinemia is the name applied to a condition characterized by a yellowish discoloration of the skin resembling mild icterus and caused by a diet rich in carotin (carrots, spinach, egg-yolk, oranges, etc.). It occurs when the diet has been largely vegetarian for some time. The pigments are absorbed from the intestines and seem to be excreted by the skin. The pigment seems to localize selectively in the horny layer of the skin, and this may account for the more intense discoloration of the palms of the hands and the soles of the feet than in other portions of the body. McGill *(Journal of the American Medical Association*, 1922, lxxviii, 281) reports briefly the case of a woman with a psychosis who, following a diet of milk, raw lemons, and about a dozen raw carrots a day, developed carotinemia. The skin of the whole body surface was a most intense yellow, more marked on the palms and soles. The scleræ were not involved. Nowhere was there the brownish tinge seen in cases of long-standing jaundice. The urine contained no bile pigments. The blood serum was bright yellow; at no time did it give reactions for bile. Carrots were withdrawn and the patient put on a well-balanced diet. There was a rapid fading of the color, and in about a month the skin was normal except on the palms and soles, where some discol-

oration was still present when the patient was last seen.

I recall very well seeing a patient about ten years ago, a woman of about sixty years of age, who became alarmed when her friends pointed out that she was becoming jaundiced. Her physician referred her to me with a diagnosis of catarrhal jaundice. Upon examination the sclera seemed clear. The feces were light brown, and the urine contained no bile. There was no itching of the skin and the pulse rate was 90 per minute. In going over her history she told me that she had been going to a quack from time to time who promised to rejuvenate her if she would take his herb medicine and live on a vegetarian diet. He lauded the value of carrots and spinach, and she forthwith restricted her diet for a number of months to these foods. When her dietary was corrected the yellowish tinge of palms and soles and rest of body rather promptly disappeared. This experience occurred before I knew there was such a thing as carotinemia, but I feel now that this was the condition which existed, rather than jaundice. At the time I felt that it was not jaundice, but couldn't explain it.

Hess and Myers *(Journal of the American Medical Association*, 1919, lxxiii, 1743) have noted the occurrence of carotinemia in children in whom the diet of milk and cereal was augmented by the addition of carrots for four or five weeks. The discoloration gradually disappeared when carrots were omitted from the dietary.

Diabetes.—The introduction of insulin has created a renewed interest in the treatment of diabetes. This remedy, which was withheld from general usage until its clinical value was definitely demonstrated, is now available for all who wish to use it. I cannot help feeling that there will come much harm from its indiscriminate use. This must be inevitable in a remedy which is not only so potent for good but equally for harm. Medical history recalls that tuberculin had a wide range when first introduced, and no one will ever know with what damaging results. It took the profession a long time to realize its limitations. I believe that insulin, although a substance of an entirely different nature, is just as potent for harm as tuberculin in unskilled hands. Unfortunate results are even now being whispered about, and for this reason it has seemed to me important to reiterate certain concepts in regard to it.

1. Insulin is not a cure for diabetes.

2. Insulin is simply an adjunct in treatment.

3. Insulin does not replace those methods of diet regulation which have been formulated by Joslin, Allen, Woodyatt, Newburgh and Marsh, etc.

4. Insulin is useful only in a small percentage of cases, probably less than one-fifth.

5. Insulin should never be used unless the patient is under direct observation and the clinician is able to plan the diet, examine the urine, etc.

6. Insulin should never be used if the physician is unacquainted with the symptoms of "insulin shock" and the method of combating it.

7. Insulin may save the life of a diabetic with severe acidosis and coma.

8. Insulin indiscriminately used is a real source of danger.

When a diabetic presents himself for treatment, therefore, it is advisable to determine if he falls in Group I, which is characterized by glycosuria, no diacetic acid in urine, no evidence of severe acidosis; or Group II, characterized by excessive hyperglycemia or glycosuria, or evidences of severe acidosis. In Group I the procedure is as follows:

(1) Weigh the patient and estimate the basal caloric requirement. This can readily be done by consulting the tables in that excellent book on diabetes by Elliott Joslin.

(2) Prescribe a maintenance diet containing .3 gm. protein per pound to replace daily wear and tear of the tissues, and add fats and carbohydrates in proper proportion (to prevent acidosis) and in amounts necessary to supply sufficient calories. A

crude but practical rule is to calculate the diet upon the basis of ½ gramme carbohydrate, ⅓ gramme protein, and 1 gramme fat to each pound of body weight. Approximately four-fifths of all diabetics can be controlled by diet adjustment alone. An interesting and comprehensive article on "Diet Adjustment in Diabetes" by Woodyatt may be found in the *Archives of Internal Medicine*, 1921, xxxviii, 125.

(3) If at the end of four or five days the patient has become aglycosuric, insulin is not indicated and the diabetes can be controlled by diet adjustment alone.

(4) If the urine continues to contain sugar on such a basal diet insulin is indicated. The amount of insulin depends on the amount of sugar eliminated at the end of the week's observation. It is desirable to start off with small doses, divided, before meals and injected subcutaneously, and in amounts sufficient to render the urine sugar-free—no more. Many diabetics wish large doses of insulin so that they can eat *"ad lib."* It is a mistake for the physician to permit these liberties. Approximately one unit of insulin will care for 2 grammes carbohydrate. If for any reason insulin is to be continued the diet should be reduced.

In Group II:

(1) The patient should be in bed, warm, supplied with fluid freely, and closely watched. Insulin is administered at once in small doses at first, increasing as may be necessary. The diet prescribed as in Group I, with an extra amount of carbohydrates in order that plenty of carbohydrate may be available for utilization when the insulin reaches the circulation. As soon as urine becomes free of acetone and diacetic acid the carbohydrates are reduced to the requirements of a maintenance diet and the insulin correspondingly decreased. The amount of insulin then given is determined by the occurrence of glycosuria.

(2) In the treatment of threatened or developed coma, keep the patient warm and force fluids—by mouth, bowel, or subcutaneously. Sustain the circulation by digitalis or caffeine. Give glucose in the fluids. In threatened coma 10-20 gm. glucose may be given per hour and 20-30 units of insulin every second or third hour, watching the urine carefully for the disappearance of sugar. Watch patient for clearance of symptoms of coma and diacetic acid in urine. If the patient is in coma it may be necessary to give glucose and insulin intravenously.

Insulin Shock.—Overdosage from insulin is characterized by weakness, pallor or flushings, sweatings, apprehensiveness, nervousness (tremor), and faintness. In severe cases the pulse becomes quite rapid and delirium, convulsions, or stupor develop. These symptoms are due to a fall in the blood sugar to .08 per cent or below. These symptoms may be completely relieved if glucose is given at once; if the patient can swallow, one or two teaspoonfuls of cane-sugar or glucose. If the patient is unable to swallow glucose, 15 minims of epinephrin are given hypodermically, and when the patient becomes conscious one or two teaspoonfuls of sugar or glucose are given by mouth. If the epinephrin injection is not effectual, then 200-300 cc of a 5- to 10-per-cent solution of glucose is given intravenously.

In conclusion I wish to state that our knowledge of nutritional and metabolic disorders is increasing with extraordinary rapidity; and although this knowledge may seem at first glance to be highly scientific, much of it is available for application in the daily problems of medical practice. The subject is by no means simple; the nutrition of such a highly differentiated animal as man is affected by so many factors, extrinsic and intrinsic, that its complexity is obvious. I have dwelt principally upon certain phases of the extrinsic factors of diet and environment. There are equally important intrinsic factors, such as digestive disturbances, infections, and toxemias, which need not necessarily be virulent and obvious, and alterations in internal secretions, etc.; all of which make a complete understanding of nutritional disorders extremely difficult.

The Immediate Cause of Cardiac Decompensation and Its Treatment

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In the present day the pathology of chronic cardiac disease, particularly of a valvular and muscular type, does not carry with it the same conception that was formerly had. Formerly it was believed that chronic endocarditis, as well as other chronic diseases, was a progressive disease —that is, that the pathological lesion was extending all of the time. The prevalent notion to-day is that chronic processes become worse mostly by acute exacerbations, due to *many* kinds of infection—that is, after the primary attack each succeeding infection, not necessarily the same as the first, pushes the patient on a little bit farther, but in the interval no appreciable progress downward is made. In the development of an acute decompensation in the past, it was believed that some strain, usually of a physical character, was necessary. At the present time the opinion is that overstrain is a comparatively rare cause of heart failure.

Pain and dyspnea act as checks to overstrain in most instances, and if overstrain does seem to induce heart failure it may be explained that the strain has opened up an avenue of infection, thus precipitating heart failure, because with heart failure of a progressive type temperature almost always occurs, and it would be difficult to picture strain *per se* as a cause of temperature. A more satisfactory explanation is that an acute infection was already present somewhere in the body at the time, and the strain merely explodes the infection. (Of this subject more at a later time.) In fact so rarely does exertion of itself without infection produce cardiac failure that it may be dismissed as almost non-existent.

Some one will at once recount the sudden death on slight exertion of a patient who was in the midst of apparent health at the time of death. Such a death is seldom due to valvular disease, and when it is due to valvular disease, on post-mortem section it will be shown that an acute infection is usually present. On post-mortem examination in any death due to heart disease there will be found in by far the majority of instances remnants of acute inflammation of the endocardium. I may say that I have seen very few patients with heart disease dying of decompensation that did not reveal gross recent changes of the myocardium. Most of the sudden deaths are due to coronary disease, and here a painstaking examination will usually reveal an acute infection somewhere in the body.

As to the form of infection, in more than 75 per cent of the cases the primary focus is an acute infection of the air-passages. I should like to emphasize the fact that the infection is usually an acute one. Because of the frequency of chronic foci of infection as a cause of disease it is easy to be confused. If rectal temperatures be taken there will be found an average increase of from half to one degree above normal. Close inspection of the throat, mouth and nose will reveal either a simple inflammation or, more commonly, one with the characteristic influenza signs, viz.: (1) Redness of the outer palpebral area of the conjunctiva; (2) redness of the anterior pillars of the fauces, varying from pink to carmine in color; (3) injection of uvula; (4) papules on the uvula and post-pharynx; (5) steno duct enlargement and injection of the same as though a pin had been inserted into it; (6) other hemorrhagic areas in the mouth; (7) cyanosis of the lip edges, and oftentimes of the skin under the nails. In some instances only a few of these signs are present.

Both sides of the nose should be inspected, and even the ear drums. It is not sufficient to inspect the nose alone, but if in

doubt a swab should be passed up behind the uvula, and the presence of blood on it will often disclose the fact that there is an open area in the nasopharynx that escapes the naked eye. Some one will at once suggest, "What's the use of subjecting the patient to such a disagreeable maneuver for the mere academic reason of satisfying oneself as to the cause of the immediate breakdown?" But this has real therapeutic consequences, as detailed farther on.

The next most likely place of an acute infection, in the absence of any kind of respiratory infection, is the kidney. A close examination of the urine will in not a few of these cardiac breakdowns reveal a moderate amount of pus, and often a few red blood cells. Here again the question will be raised how one is to tell pus from white blood cells. A good working rule is that if there are more than fifteen cells to the field it is fair to assume that an inflammation of some kind along the G. U. tract is present. This is so often true as to be the rule rather than the exception.

As to the digestive tract, it is true that most cardiacs in the stage of decompensation from any cause manifest digestive syndromes. These occur as a result of the disease and not as a cause, but the presence of either abdominal pain or diarrhea is strong evidence that infections are a likely cause, and may precipitate heart failure. In the rare cases that do not have either respiratory or kidney dysfunction, and in the absence of any other manifest signs of acute infection, our attention should be centered on the gastrointestinal tract. The only cases that are difficult to explain are those wherein a young adult skips rope, runs up a hill, or dances excessively, and in the midst of apparent health drops over dead. These cases are sufficiently rare to raise the question as to whether the individual did or did not have some ailment preceding the fatal issue. The objector will raise the question that the person said that he or she was never quite so well, and was in excellent spirits at the time of death. Now, I should like to have all of you closely examine the mouth and fauces of say the next twenty people who come into your office at this (winter) time of year, complaining of illness or of an accident in some other part of the body than the throat. You will I am sure be astonished to find the large percentage (from sixty to seventy per cent) who have the evidences of an *acute* infection in the mouth or fauces, as described above, and who will assure you that outside of the accident or other trouble complained of they never felt better in their lives.

It is a well-known axiom that cardiacs seldom die in the summer-time from cardiac accidents. One may say that infections are at a minimum in the summer. We always charge up the sudden death occurring in the winter-time to the cold weather, when a cardiac patient gets up feeling well in the morning, goes out into the cold, and drops dead at the top of the subway stairs. Not a few of these, if examined in a routine manner, present unmistakable evidence of carrying infection in their fauces. I do not mean to say that all of these patients in whose mouths and throats one sees in the course of a routine examination evidences of an acute respiratory infection will develop the palpable evidences of a head or chest cold, but if you will follow up these patients you will almost always find (1) that some one else in the family has had or will have a troublesome head cold, or (2) that within a few days the patient himself will experience one. A few will merely act as carriers, and if the exploding agent, whatever it may be, whether exercise, mental disturbance, or what not, does not occur the patient is none the wiser as to his being a carrier. Piles, acne, conjunctivitis or any raw surfaces should all be examined closely. If any such surfaces be found they should be treated and healed, as until they are healed and well the endocardial attack will not progress favorably.

The problem will often arise as to when does the endocardial lesion begin in the course of an infection. In influenzal infection it is often not so difficult to decide,

because the regular three and one-half day rise comes with great regularity. The presence of a steadily continuous type of temperature, or with daily excursions, would point to the existence of an acute endocarditis.

As to a simliar condition occurring in other forms of *vascular* disease, notably in an apoplectic stroke, the usual story is that the patient was quite well at night, went to bed, and woke up with a stroke in the morning. His arterial system is no better, no worse, than it has been for years. What causes the explosion? I beg of you to inspect the mouth and nares of your next patient immediately after the stroke. Do this in a good light, and if you do not find the evidences of an *acute* catarrhal inflammation of the nose and throat, unsuspected by the patient, I shall be greatly surprised. Again I want to impress on the reader the acuteness of the lesion. Of course other infections do precede strokes, but so many of the strokes are preceded by respiratory infections that it is always well to look for evidences of them. The rise in temperature which so often accompanies a stroke is of itself quite suggestive. It is curious how some individuals are more prone to thrombosis and others to hemorrhage with the same type of infection. In the one case the infection is prone to injure the vessel walls so as to produce a hemorrhage, whereas in others thrombosis occurs. E. Libman has called attention to this phenomenon. Possibly this is an inherited weakness or predisposition, but a discussion of that phase of the problem would lead us too far afield. One may thus vizualize the phenomena of decompensation and stroke, if in every attack of a head cold or minor illness one pictures the influx of a large number of germs into the circulation, which are normally killed by the blood, but which when they find an already damaged endocardium or interior coat of the vessel already roughened, are prone to lodge there. This is of course merely a schematic pathophysiological explanation, and is open to question, but it may serve to vizualize for the layman. At any rate the analogy holds that, preceding strokes or vascular diseases of any kind, respiratory disturbances or other foci of acute infection are almost invariably present.

As to treatment, the first principle is to stimulate nature to repair the damage done. Some one will raise the time-old issue that painting, or even spraying the mucous membrane of the throat and fauces, has little or no effect on the disease process itself, and that its effects pass off quickly. Inasmuch as these red areas are the only evidences of a focus of the disease, and the disappearance of all of these inflamed areas, so far as we know, occurs simultaneously with disappearance of all of the signs of the disease, a connection seems assured. Any one who watches the effect of, say, a ten-per-cent silver nitrate solution applied liberally to a red anterior arch of the fauces, and who witnesses the blanching of the mucous membrane due to a deposit of the silver in the layers just beneath the surface, will have difficulty in claiming that its effect is only transitory. The fact that there is often a coincident slight inflammation of the conjunctiva would speak for the constitutional character of the infection—*i. e.*, that these mouth signs were merely the local expression of a constitutional disease, and that only by vaccines could sufficient immunity be readily established, just as we hope to establish local immunity by the use of counter-irritants, such as silver and iodine salts. Unfortunately at the present time there is no unanimity as to the particular organism that causes any of these infections, and one would be acting blindly in resorting to vaccines. However, there can be no valid objection to trying a stock vaccine if one is striving to produce a protein shock reaction. In doing this great care must be exercised, because surely no one would care to produce a shock reaction in a decompensating cardiac. A few cases react well, but we do not as yet feel like recommending the procedure as a routine.

At present one's chief hope is in estab-

lishing local immunity, and thus causing disappearance of the local lesions, as noted in the mouth, by means of irritants. This opens up the whole subject as to how nature herself heals inflammatory processes, either locally or in totality, as in infectious disease. At present it is the general opinion that nature herself, properly stimulated, does the work, and that leucocytosis, either local or general, is a dominant factor.

For this purpose one group of men will suggest emollient agents, such as do not cause the patient any distress. Some of the more popular organic silver compounds possess this qualification. Personally I feel that while such agents may be of service in washing off the surface of the mucous membrane they do not penetrate beneath the surface. To the one who has not thought much on this matter the idea of shooting the germs is always uppermost in the mind. The fact that some of these preparations contain a large amount of silver, and as silver is a good germicide and there is so much of it present, it must be good therapy. Where for any reason an irritant cannot be employed, then its use is justifiable. It has some value as a cleansing agent, but the real inflammation in these cases is beneath the superficial layer of the mucous membrane, and thus is not reached by the treatment. Any irritant, no matter what it may be, is of much service. It accomplishes results because of a local chemotactic effect on the leucocytes. The handiest remedy is silver nitrate, say in two- or even ten-per-cent solution. I have arbitrarily suggested two-per-cent solution as the first application, even though experience shows that often a ten-per-cent or even a twenty-per-cent is a better agent, because in some individuals there is hypersensitiveness to silver solutions, and severe reactions occur in such people if strong solutions are used. This is a personal observation, and is contrary to the accepted belief that local reactions are for the most part similar. Of all irritants it more nearly possesses the qualifications sought for, because of its penetrating at least beneath the superficial layer of mucous membrane and coagulating there.

Something must be done to bring about a local leucocytosis, which after all is nothing more than stimulating nature to heal. The preparation should be painted carefully over all of the red spots, no matter where they may be, mouth, throat, nose, pharynx, etc. The discomfort disappears within a half-hour, and the patient should be warned of this discomfort. If the patient is too sensitive a preliminary painting with cocaine may be done, but this does not seem to produce the same results as when the membrane is not prepared by the cocaine. Instead of the silver solution an iodine preparation, preferably inorganic, and not strong enough to produce excoriation, will accomplish the same results, or if the practitioner likes an iron salt it will answer quite well. Where painting is not feasible a spray of the same solution, but of weaker strength, is advisable. Such irritants should not be applied too often, or else nature will be stimulated beyond her reactionary powers. Once or twice a day is all that is necessary.

In the cases that are due to kidney inflammation frequently hexamethylenamine is a useful agent; in others alkalinization of the urine; and so on. In the bowel cases the use of frequent doses of castor oil, calomel, irrigations, and of suitable dietary will be of service.

So that, to sum up, in any case of cardiac or of vascular disease, whether it be endocarditis or endarteritis, one should endeavor to fathom the cause of the immediate breakdown: (1) the mouth and throat, and even nasopharynx, should be closely inspected, even with a swab if necessary; (2) the urine should be examined for blood and pus cells; (3) the digestive tract from mouth to anus should be queried; any eruption such as pimples, piles, etc., should be carefully considered.

By the addition of this schema of therapy one more line of treatment is added in an attempt to lessen the long illnesses so common in the life history of the cardiac.

This is a much more rational way of treating an immediate cardiac breakdown than by trying to treat the heart itself, by digitalization alone, as is usually done. By this I do not mean to criticize the use of digitalis, but in most instances its value is only secondary. It is much more rational to heal the point of origin of the acute infection than to treat the results.

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The New Topical Treatment of Gastroduodenal Ulcer and Other Gastric Conditions

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In an article recently published[1] I presented a method for the treatment of gastroduodenal disease which has demonstrated its effectiveness in bringing about distinct improvement.

The purpose of this paper is to reëmphasize the importance of treating cases by this method and to give impetus to the employment of mechanical means in the production of a cure or improvement in the healing of ulcer. To merely diet these ulcer sufferers is not sufficient. The addition of alkalies and antispasmodic medication unquestionably aids very much, but often proves inadequate in the production of complete relief from symptoms, let alone cure. To operate surgically without previously indulging in some medical means of mechanical treatment seems to me unreasonable, and it is for this mechanical principle of medical treatment that I strongly urge consideration. This mechanical treatment does not mean merely intraduodenal feeding or simple gastric lavage, but rather a direct treatment which has as its object a neutralization of the gastric contents and a direct stimulating effect upon the lesion in the direction of healing.

Ulcer that we ordinarily encounter in human beings is not of the acute type. Before the individual presents himself for study the ulcer, if ever acute, has already developed a chronic character. To heal such ulcers or even attempt to drive away the associated untoward symptoms by dietary and pure medical means is a difficult or unsatisfactory procedure. If in conjunction with such practice the mechanical method as hereinafter outlined is properly employed, improvement should be obtained. This betterment, however, cannot always come immediately, and oftentimes may require months for its complete attainment.

When operation is performed to correct conditions associated with gastric or duodenal ulcer, the improvement as a rule owes its origin to the removal or alteration of some mechanical factor. This mechanical operative procedure either radically removes or in a compensatory manner overcomes a mechanical obstructive element, or so improves the function of the stomach and duodenum as to approximate the normal status of these organs. If an ulcer excision alone proves successful, the symptoms which had their origin in the ulcer area are removed. If a gastroenterostomy has proved beneficial, then either better drainage has been brought about or other improvement in function has occurred because of its presence. The same may be said of sucessful pyloroplasty or gastric resection. There are, however, times when these operations prove unsuccessful and do not realize the object for which they are instituted, and it is for this reason that we should employ mechanical intervention of a medical nature before advising mechanical surgery. Surgery should only be employed after every medical measure has failed, or

[1] *New York Medical Journal*, June 6, 1923: A New Method of Topical Treatment in Gastroduodenal Disease.

in those far-advanced cases of ulcer which from every medical or roentgenographic indication point to the existence of permanent deep-seated ulceration of the wall which contributes to development of marked mechanical defect in function. If ulcer cases come to the physician before these changes have taken place, the institution of medical mechanical treatment may go a great way toward the production of a cure.

In urging this local or topical attempt at a cure of gastric or duodenal ulcer, I am not unmindful of the possible constitutional factors that may have a bearing upon the etiology of ulcer. Many still believe in the old view that an ulcer results from a disturbance in the circulation of a portion of the mucosa with its resulting loss of tissue vitality. Whether this disturbance follows from thrombi or emboli in the smaller vessels of the part, or because of disturbances in the nerve supply to the arteriole, is a question. The influence that the different anemias may have in the production of ulcer has also been considered. The possible bearing that toxic elements in the blood or other factors of a constitutional nature resulting from disturbed metabolism may have, has been surmised. The local influence that mechanical, chemical or thermal factors may have has also been theoretically and experimentally valuated. The devitalizing influence attributed to persistent hypersecretion and hyperacidity and the vulnerability resulting from lack of secretion have also been regarded. Some even feel that ulcer may owe its presence to a lack of antipepsin in the blood or walls of the stomach. The specific influence that bacteria may have in the production of ulcer in certain tissues looms forth rather prominently. The work of Reeves regarding the blood supply of the stomach and duodenum, and the poor tendency toward anastomosis, must not be disregarded.

From the foregoing possible causes of ulcer it can readily be appreciated how complex the question of ulcer origination really is, and it therefore necessarily implies that a cure is far from simple. To ascertain the nature of the constitutional defection would be a remarkable accomplishment, for then the cure would surely be at hand, but since we have no means up to the present for absolutely making such a determination, we must rely on the best that experience has afforded.

Diets of different forms have been utilized and antispasmodic and neutralization treatments have proven of great service, but very little stress has been given to consistent and routine topical treatment, although it has in the past been advocated from time to time. The method that I have urged is simply a new modification of older ideas, and it is in the hope that impetus will be given to its employment that I have urged its introduction. This treatment also has the advantage of being applicable as an ambulatory procedure. The only possible disadvantage of the method is the fact that many patients, unless made to understand the nature of their illness and its difficulty of cure, will not lend their coöperation and moral support. Once this is overcome, remarkably beneficial results may be obtained.

The method consists of thoroughly flushing out the stomach with bicarbonate of soda solution, and then instilling a specially prepared solution of colloidal silver or colloidal iodine. The patient is usually given this treatment in the morning. Having fasted all night, he is advised to partake of no breakfast or drink. Coming to the office with a fasting stomach, the patient is given the small fractional tube to swallow. The fasting contents are removed, and the stomach is then rinsed clean with plain lukewarm water. Following this, the stomach is flushed out with a weak solution of sodium bicarbonate (30 gm. to pint). This flushing is performed in a thorough manner, at least 1000 to 2000 cc of solution being employed. After the stomach has been satisfactorily emptied, a preparation of silver colloid (0.05-per-cent solution) or iodine colloid (1-per-cent solution) 30 to 60 cc is instilled into this organ and allowed to remain. Of course

it becomes evident that a certain quantity of the bicarbonate solution during the washing process enters the duodenum, thence into the intestine, but no untoward effects have followed. Occasionally after the administration of the silver colloid a temporary nausea may manifest itself, but this does not occur often. The flushing of the stomach may be performed through the medium of a large Triumph syringe (4-oz.), with which we can fill and empty this organ. During the alkaline treatment the stomach is filled with the solution to the point of subjective tolerance (up to the point when the patient says he feels quite full). The solution is allowed to remain in contact with the gastric mucosa for five minutes and then is removed from the organ. This procedure is repeated a number of times within a period of twenty or thirty minutes. The entire topical treatment should take up from twenty to thirty minutes, and may be continued for months or even years at intervals.

This treatment has been employed in cases of gastric ulcer, duodenal ulcer, chronic gastritis, chronic duodenitis, and other gastric conditions such as chronic hypersecretion and hyperchlorhydria, and marked subjective and objective improvement has been noted. Of course this topical treatment has been employed in conjunction with other medical and dietary means of treatment, but the decided betterment, I am fully convinced, owes its initiation to this topical process. The additional long-continued antispasmodic and alkaline medication, with regulated diet, has helped greatly in continuing apparent good health. To claim that ulcers are susceptible to early cure by this treatment or any treatment for that matter would be somewhat unreasonable. It is my opinion that ulcers of the stomach or duodenum are not readily cured, and when cured have attained this state only after a long course of medical treatment (from six months to two years or longer). The improvement, however, with this form of treatment has been so marked and sufficiently lasting in effect to make me feel that time, with proper observance on the part of the patient, will result in permanent cure. The complicating disturbed stomach or intestinal function which is usually associated with ulcer of either the stomach or duodenum probably causes the many symptoms often complained of, and of course when these symptoms are abolished it does not necessarily mean that the ulcer is cured, but it does imply that the ulcer has undergone improvement. If the ulcer has once been stimulated toward healing, proper medication such as antispasmodics and alkalies, in conjunction with indicated diet, will continue the improvement, but it is more for the purpose of arousing or initiating the healing process that this topical treatment is employed.

The improvement as a result of this treatment may be explained as follows:

1. Daily thorough cleansing of the stomach from the start, and continued cleansing for weeks or longer, have the effect of not allowing stagnation in the stomach or overburdening with foods beyond normal limits of time.

2. Daily cleansing in all probability also has a stimulating tonic influence upon the gastric musculature and mucosa.

3. Thorough cleansing with bicarbonate of soda solution most likely rids the stomach, as nearly as possible, of all mucus and whatever diseased infectious material may be admixed with it. Not alone the superficial lining but the mucosa lining the secreting tubules is in this way *cleansed* and *rid* of diseased material.

4. The daily neutralization of the acid contents with alkali probably improves the stomach medium, and in this way promotes healing, or the daily exposure in a thorough manner of the gastric cells and glands to such alkaline material may depress the secretion of highly acid juice, despite the view held by some authorities that a defensive highly acid elaboration follows upon administration of alkali.

5. The osmotic influence that the bicarbonate solution may have upon the gastric lining may possibly contribute to ulcer heal-

ing or shrinking. This beneficial influence may not only affect the mucosa but also the musculature of the stomach.

6. The removal of the mucus from the stomach by the bicarbonate solution exposes the ulcer and stomach mucosa directly to the supposedly beneficial action of the silver or iodine colloid to be later introduced.

7. The effect of silver colloid solution may be regarded as germicidal, thus reducing the degree of infection in the stomach wall, or diminishing its tendency toward the development of infection. In this way it is possible that the ulcer is stimulated to heal through the reduction in the possibility of its infection. This germicidal influence on the part of the silver colloid may be due to different factors: (1) The specific effect upon bacteria by essential metallic silver; (2) the destructive influence that colloidal bodies through their colloidal activity or presumed catalytic effect may have upon bacteria; (3) the adsorptive influence that the innumerable quantities of colloidal particles may have upon bacteria or toxic bodies within the stomach cavity or wall.

8. The silver colloid may benefit the healing of ulcer through its neutralization of the HCl of the gastric secretion or by its direct effect upon the cells that secrete the acid.

9. In our endeavor to understand the improvement following the topical use of sodium bicarbonate and colloidal silver or iodine, we must not overlook the possible influence that these substances may have upon the stomach antrum, since we believe that this area of the stomach, according to Edkins, elaborates a hormone which is supposed to stimulate the glands of the fundus to secretion. Is it possible that these substances depress the stimulating influence of this gastric hormone, or is the nature of the fundal secretion altered as it is elaborated? May not these introduced substances so thwart the effect of the HCl in the stomach as to not allow the conversion of excess zymogen into active digesting ferments, in this way probably indirectly stimulating the healing of ulcer processes? May not these substances in a similar manner affect the duodenal mucosa and its hormone secretin? These are interesting problems for solution and mental reflection.

10. The silver colloid may also through its entrance into the blood, after repeated instillation, affect the liver in such a way as to improve its general detoxicating function, thus indirectly benefiting the entire organism and consequently the power of healing ulcer.

Thus far every patient who has been treated by me with this method has, as far as I am able to determine, shown remarkable improvement and many seem cured. At least, I feel that I can say that the result of treatment of gastroduodenal ulcer with this method has far surpassed that obtained with other medical methods. The following few cases will illustrate the improvement encountered:

B. L., aged forty years, came to me January 21, 1922, complaining of severe epigastric pain, nausea, and vertigo. His illness dated back ten years. During this time he had suffered more or less from cramps most violent in type in the region of the epigastrium—cramps associated as a rule with vomiting; also heartburn and bloating. After seeking relief from many sources the patient was operated upon in February, 1920. A saddle-shaped ulcer was found on the posterior surface of the lesser curvature near the pylorus; also adhesions of the ascending colon to the parietal wall. A posterior gastroenterostomy was performed. There was slight improvement in the patient's condition for about three months, when a recurrence of symptoms suggestive of gastrojejunal ulcer appeared. Fluoroscopy evidenced a small defect corresponding to the ulcer area, and the stomach seemed to be working quite well. In fact there was hypermotility and hyperperistalsis. There was no fluoroscopic evidence of gastrojejunal ulcer. The Wassermann test was negative. The chemical studies presented hyperacidity and hypersecretion. The gastric contents exhibited

blood in fairly large amounts, evidently due to active bleeding. The patient was despondent and constantly threatening suicide because of his great suffering. He has been under treatment now for over a year and is feeling markedly improved. From the start of the treatment he began to show betterment. He has gained twelve pounds in weight and is subjectively and objectively improved. To him life is now worth while. The fluoroscopic picture evidences distinct improvement in peristalsis, motility, and tone, although the defect is still seen but not nearly so prominent.

R. B., aged twenty-five years, came to me October 23, 1922, complaining of excruciating constant pain in the region of right lower chest anteriorly and posteriorly, associated with a good deal of belching. Upon close questioning I was able to ascertain that some of this pain was more or less localized in the region of the ensiform cartilage, but rather deeply located. She also thought that there was some slight interference with swallowing. Her trouble had begun suddenly about seven months previous with pains across the back at the level of the lowest ribs. She had been treated by a number of physicians with alkalies and diets of different types. She also experienced explosive belching after meals, and the pains assumed a piercing, crampy character. Coincidentally she experienced profound constipation. Eating, of course, aggravated whatever pain existed at the time. Upon studying her I found that she had a distinct continuous hypersecretion and hyperacidity. The *x*-ray evidenced a chronic moderately obstructive duodenal ulcer with a small residue at six hours. Her diet was immediately corrected, she was given alkali and antispasmodic treatment, in conjunction with proper topical measures, and soon there was noticed a gradual relief from her distress, and within two months she felt entirely well. She was very much impressed by the results owing to the previous many failures encountered by other methods. At the present time she feels perfectly well and comes back for treatment once every two weeks. Fluoroscopically she evidences no more residue at six hours, and the duodenal cap fills out more satisfactorily than at the first examination.

M. B., aged thirty-eight years, came to me November 6, 1922, complaining of pain in the right upper quadrant two hours after meals. He had been ill off and on for the past three years and had lost considerable weight. He had intermittent attacks of distress for weeks at a time. These attacks were characterized by right upper quadrant pain which came on two hours after meals, dull in character and somewhat relieved by alkalies. He also complained of a great deal of epigastric fulness. Chemical analysis revealed hypersecretion and hyperacidity. The *x*-ray evidenced a small non-obstructive ulcer at the base of the first portion of the duodenum. Following the associated topical, dietary, alkali and antispasmodic treatment, this patient made an excellent subjective recovery and gained something like sixteen pounds in a few months. During the three years of his illness he had been undergoing treatment at the hands of several physicians without any evidence of success being attained.

These three cases only emphasize the possibilities to be expected from a proper topical treatment when employed in conjunction with other medical methods. In a later paper I hope to be able to make a report in detail of the gastric chemistry findings both before and after treatment, as well as the comparison of *x*-ray findings before and after treatment. I may at this time say that in the few cases in which studies in this direction have been made, I have found a definite diminution in the degree of acid content as well as a reduction in the tendency toward digestive and interdigestive hypersecretion. These results were obtained within a month after the beginning of the treatment and seem to continue favorably.

From the foregoing I am led to the opinion that early and continued topical treatment as advised in my first paper will bring

about decided subjective and objective improvement in cases of gastric or duodenal ulcer, or other gastroduodenal conditions, and if introduced as an early treatment in disturbances of the stomach and duodenum may prevent the development of ulceration despite the fact that existent constitutional forces lean toward ulcer creation. The remarkable results following this treatment must be attributed in a great measure to alkaline lavage, but the fact that we are able to instill into the stomach iodine or silver in such great quantities with absolutely no fear of toxic effect is also a scientific accomplishment for which we must be appreciative. No doubt the iodine and silver have excellent healing qualities and should prove of value in the future. The preparations employed are made by a certain pharmaceutical concern whose name for ethical reasons I shall not mention in this paper, but will gladly furnish personally to any physician who may be interested.

427 Park Ave., New York City.

Points of Interest in Obstetrics and Gynecology Based on a Recent Book[1]

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This combined text-book, the authors hope, will impress the medical student with the importance of a thorough knowledge of obstetrics, and with the fact that the great majority of ailments encountered in gynecologic practice are the results of infections and injuries contracted during parturition.

The authors represent the Obstetric and Gynecologic Hospitals of Glasgow and Edinburgh, and the book is, therefore, a Scotch book.

The account of the anatomy of the reproductive organs is good and the illustrations are clear and sufficient. In dealing with the physiology of the reproductive system modern knowledge of the ductless glands receives adequate attention. They state the modern view that menstruation results from the action of a hormone produced particularly by the corpus luteum of the ovary. For the success of this function the activity of the whole chain of endocrine glands is essential. The relation of the calcium in the blood to this function is stated. They also give the modern view that it is not the influence of the gonad which determines the sexual characteristics of an animal. The authors condense clearly what is practically known concerning the functions of the thyroid, pituitary, suprarenal, pineal, thymus and mammary glands.

The development of the impregnated ovum is stated concisely and illustrated clearly. Some of the illustrations are original and useful. In estimating the size in length of an embryo Dührssen's table is omitted. The fetal circulation is briefly but clearly given. Considerable space is afforded the embryology of the reproductive organs and sufficient and good illustrations are appended.

In diagnosis, Sims' posture and speculum are advised and illustrated. The uterine

[1] A Combined Text-book of Obstetrics and Gynecology. By J. M. Munro Kerr, M.D., F.R.F.P. and S. (Glas.), Professor of Obstetrics and Gynecology, Glasgow University; James Haig Ferguson, M.D., F.R.C.S. (Edin.), Gynecologist, Royal Infirmary, Edinburgh; Obstetric Physician, Royal Maternity Hospital, Edinburgh; James Young, D.S.O., M.D., F.R.C.S. (Edin.), Assistant Physician, Royal Maternity Hospital, Edinburgh; James Hendry, M.A., B.Sc., M.B., Senior Assistant to the Muirhead Professor, University of Glasgow. William Wood & Company, New York, 1923; E. and S. Livingston, Edinburgh, 1923.

sound is pictured and a warning is given against its use.

In describing the abdomen in pregnancy we are interested in the use of words not often seen in medical writing, by which the authors speak of "herniation" and "dehiscence" of the tissues of the skin producing the characteristic striæ of pregnancy.

In describing the functions of the placenta the writers state that the malarial parasite never passes from the mother to the fetus. How, then, would they account for evidencess of malaria in the fetus in convulsive movements simulating the chills of the mother, and in the presence of the characteristic parasites in the fetus after birth? The writer has several times seen infants born of mothers suffering from pneumonia who, themselves, had the disease. It is difficult to understand this unless the infective germs can pass through the placenta.

The authors naturally adopt the views of Mackenzie concerning the condition of the heart in pregnant women.

A very useful chapter is given on the preparation of the food constituents for transfer to the fetus. Here the importance of calcium is emphasized. The authors conclude from their review of the excretory system of the mother that the fetus is built up from the food ingested by the mother rather than from maternal tissues. The mother's endogenous metabolism is very little disturbed, changes taking place in her exogenous metabolism. They see in the common changes in the teeth which complicate pregnancy, evidences that the mother fails to supply sufficient calcium for the nourishment of her fetus and herself.

They believe that no one sign is sufficient to justify a definite opinion of the existence of early pregnancy (a wise and prudent statement). They describe and illustrate examination for diagnosis during pregnancy, calling attention to the great value of palpation and auscultation. The signs of pregnancy in the various months are tabulated and a table of differential diagnosis between six months' pregnancy, ovarian tumor and uterine fibroid is appended. There is also a description of the signs of a former pregnancy.

In estimating the duration of pregnancy they state that the law in Scotland and France places a limit of three hundred days or ten calendar months for legitimate pregnancy.

In describing the management of pregnancy the importance of prenatal care is emphasized. An hour's rest, after the middle of pregnancy, should be taken during the day. In preparing the nipples for lactation they believe that they should be hardened or toughened by an alcoholic lotion. An ointment may be used if necessary. The urine should be examined at monthly intervals for the first six months, and after that more frequently. This examination should include the estimation of urea and sugar. Pelvimetry in a primipara should be made at the earliest possible opportunity. The comparative test of the fetal head and pelvis should be made not later than the end of the eighth month. Three weeks before the probable time of labor all pregnant patients should be examined to ascertain the presentation and position of the child. The history of a previous difficult pregnancy or labor calls for external and internal examination as well.

In treating the important subject of the toxemias of pregnancy, the writers take the view expressed by the majority of British obstetricians that conditions in the kidneys are, in varying degrees, not all toxemic processes, but that there are several separate pathological conditions which are styled "the kidney of pregnancy" and "the nephritis of pregnancy." Some recent articles by British obstetricians emphasize this contention. The authors, in common with other obstetricians, find evidence that pathological conditions in the placenta and site of ovular attachment are essential phenomena in the toxemia of pregnancy.

In treating of hyperemesis gravidarum they recognize clinically two varieties, the neurotic and the toxic. They place stress upon the ammonia coefficient, but have lit-

tle or nothing to say regarding the blood urea. American obstetricians have come to place little importance upon the ammonia coefficient in the urine, and the tendency of study in this country lies more in the direction of investigation of the condition of the blood. Neurotic cases of vomiting of pregnancy should yield to treatment, while toxemic cases are far more serious. In deciding to terminate pregnancy the authors would be guided by the ammonia coefficient. In this they differ markedly from their American colleagues.

Many other disturbances less severe are thought to be toxemic because they respond to antitoxemic treatment. The authors speak of "preëclamptic toxemia" and of eclampsia, and in the latter recognize the pathological condition in the liver demonstrated by Ewing and others. They accept the present tendency to regard eclampsia as a very dangerous type of toxemia, due to some form of protein poisoning resulting from ferment activity in the region of the placenta. They add that even the convulsions may be explained on this basis.

Their treatment of eclampsia is conservative and eliminative. Veratrum viride, chloral hydrate with bromide, morphine and chloral are all to be used. Ether is dangerous because tending to pulmonary edema; chloroform is better, although it may damage the liver; and best of all, spinal anesthesia! Elimination is to be pushed, but the hot pack, steam bath and pilocarpine encourage pulmonary edema. Bleeding and transfusion, copious lavage of the digestive organs are indicated. Serum treatment has given little or no result, operative interference should be carefully limited and, if possible, confined to easy delivery by forceps. In suitable cases Cæsarean section is indicated at six months by vaginal hysterotomy; and the best results have been obtained by very conservative treatment and by the least possible interference. In this opinion their American colleagues can most heartily join.

Displacements of the uterus complicating pregnancy receive adequate attention and the knee-chest posture is illustrated, although little is said concerning its use. In dealing with tumors complicating pregnancy the removal of the entire uterus in malignant disease is advised as soon as possible, and ovarian tumors should also be removed so soon as discovered.

The important section of "The Placenta and Its Diseases" contains an excellent illustration of infarction of the placenta. Under the paragraph, "Abnormal Adherence of the Placenta," placenta accreta is not mentioned under that name, although it is stated that the villi of the chorion grow into the muscular wall of the uterus in some cases. The importance of this condition is not emphasized. In the treatment of abortion we observe considerable difference from the usages most followed in this country. The complicated intrauterine douche tube described is little used here, nor is the laminaria tent, and the tendency on the part of American obstetricians is to terminate or perform therapeutic abortion by anesthesia, dilatation of the uterus with solid dilators, curetting and packing.

In treating of premature labor the statement is made that it is very doubtful if a child born at twenty-eight weeks can survive. It is also stated that few children survive if born about the thirty-third or thirty-fourth week. That has not been the experience of the reviewer or of others of his acquaintance.

In dealing with the disturbances of the excretory system in pregnancy it is stated that, next to syphilis, chronic nephritis is the commonest cause of death of the ovum. In this book the writers take the view commonly held by English obstetricians that there are several conditions of the kidney obtaining in pregnancy which are not those found in the toxemia of pregnancy. They admit that the differential diagnosis of chronic nephritis complicating pregnancy is sometimes very difficult when the attempt is made to distinguish this from preëclamptic toxemia. There is less globulin present in the urine in nephritis, and the statement is made that albuminuric retinitis is very

seldom found in preëclamptic cases. When treatment is considered we are told that it should be carried out on exactly the same lines as for preëclamptic toxemia; even less hesitation should be shown in emptying the uterus, and eye changes are most valuable indications. In our experience, one can recognize the congested kidney of pregnancy without difficulty; but other conditions, we believe, are essentially toxic and, as the writers state, are treated from this point of view. Eye changes are not at all uncommon in our experience in toxemic patients.

The section on labor is clearly and concisely written and well illustrated. They make four positions of each presenting part and give the mechanism of labor from that standpoint, but omit to describe the mechanism from each of the four positions. It seems to us much more reasonable to follow the method of making but two positions and then dealing fully with unusual rotations.

In the management of normal labor, especially in primiparæ, the patient is placed upon her left side and the exit of the head is controlled by the left hand of the obstetrician, passed over the patient's abdomen and between the thighs, while the anal orifice is covered by gauze in the right hand. This is illustrated and labeled "British method," probably from the comfortable belief that all which is good is British; but this we saw as a student in Vienna a considerable time ago, and we have practiced and taught this method, and so have others in this country. They would rupture the membranes when the os is fully dilated and encourage the patient to pull upon a towel tied around the top of the bed during her active pains. A better result is obtained when a long sheet is fastened to the foot of the bed and the patient pulls toward the foot of the bed. It is stated that the attendant must watch for the escape of fecal matter from the anus, forced out by the head. If the patient had received a thorough enema once or twice during the first stage of labor the rectum should be empty during the second stage. Nitrate of silver is used in the eyes of the child, and stitches may be inserted to close lacerations before the delivery of the placenta. The writers object to the use of an abdominal pad over the uterus after delivery. In spite of its disadvantages, chloroform is usually employed during labor in England. The use of scopolamine and morphine is described, the dose of scopolamine one one-hundredth grain. It is stated that chloroform may be required during the active stage of labor.

In treating of abnormal labor, the statement is made that the clinical training which the undergraduate receives in the British Empire is totally inadequate. We can sympathize with this condition, because it is with great difficulty that adequate clinical training can be given to undergraduates in the United States. Abnormalities in delay and rapid labor are well described, and in dealing with occipitoposterior cases long and short rotations are tabulated in a very distinct and useful manner. The importance of the position of the trunk of the child in posterior rotation of the occiput is emphasized. In the management of these cases the writers would not wait longer than two hours without interfering if anterior rotation did not begin after strong uterine contractions. Manual rotation by grasping the head with thumb and fingers, or by passing the hand beyond the head on to the shoulder and rotating the trunk, is the desirable procedure. If necessary, the patient should be deeply anesthetized and placed in the exaggerated Sims position. This position is thought to be especially valuable.

Face presentations and labor are described by the same method as occipitoposterior, with short and long rotation. Opportunity should be given for anterior rotation of the chin, and if this fails Thorn's method of changing the face into a vertex presentation should be tried. This failing, as in occipitoposterior positions, the chin should be turned in front by the hand under anesthesia. Occasionally the forceps is successful.

Brow presentation is said to be the most unfavorable position of the vertex, but we

do not see that the vertex enters at all into brow presentation. The writers would permit the early performance of version, although seldom necessary, and they would try to convert the brow into a vertex or face.

In diagnosis of breech presentation the all-important landmark is the rough surface of the sacrum and the tip of the coccyx. The forcing of meconium out of the child's bowel is an important diagnostic sign. Four positions are described, and the method of delivery employed is that usually practiced, caution being urged not to pull the trunk upward and forward too soon. The complications of breech presentation are clearly described and the use of the forceps to the after-coming head.

They would employ prophylactic version in transverse positions, aided by placing the patient upon the side toward which the head is directed. Where the arm prolapses, a loop of gauze should be placed about the fetal wrist.

The writer's attitude toward cases in which the child is of unusual size, and in which, also, the cord prolapses, is conservative. He would rarely resort to Cæsarean section, choosing craniotomy in large children and methods of replacing the cord instead.

The subject of contracted pelvis is well presented, and there are useful illustrations showing various methods of measuring the pelvis. The test for the comparative size of pelvis and head is also given. In describing the treatment of contracted pelvis podalic version is not considered appropriate. The use of forceps is limited to a true conjugate of 3½ inches, and Walcher's position is recommended in doubtful cases. Pubiotomy is not a competitor with Cæsarean section, but is the alternative of forceps and brute force. A true conjugate of 2½ inches demands Cæsarean section. With a true conjugate of 3½ inches the relative size of head and pelvis must be very carefully estimated, and then a method of treatment definitely selected. Where a patient has already been subjected to attempts at delivery craniotomy should, in most cases, take the place of Cæsarean section.

In dealing with delayed labor where the cervix is rigid, a certain proportion of these cases will, in future, be treated by Cæsarean section. The forcible dilatation of the cervix and the delivery of the child through the whole length of the birth canal by forceps is to be avoided.

In dealing with labor complicated by the presence of an ovarian tumor, the writers differ from American obstetricians, for they avoid Cæsarean section by displacing the tumor and delivering the patient through the vagina. The tumor is removed after the woman recovers from the childbirth. The retention of membranes is considered important because sufficient decidua is retained to favor the development of septic infection. They advise introducing the hand within the uterus to remove retained membranes. In this country an expectant plan would be followed, for the retention of membranes alone is thought to be of little importance. Placenta accreta is not mentioned, but there is a good illustration of the ordinary manual removal of the placenta.

Postpartum hemorrhage is usually prevented by retraction of the uterus. Interference with this natural process by manipulation and other disturbance may cause bleeding. Toxemia is not considered as a cause of hemorrhage. Bleeding can ordinarily be controlled by pituitrin and by manual compression of the uterus. Packing the uterus with gauze is very seldom necessary. Blood transfusion, by direct transference from artery to vein, was not successful in their experience. They state that, in America, professional donors reside near the hospitals and are paid a definite fee when employed. Citrated blood they have used to advantage. As retraction of the uterus is necessary to prevent hemorrhage, it also is required to prevent inversion of the uterus. The writers have found it an easy matter to replace the acute inverted uterus.

In placenta prævia, the first hemorrhage has been noted about the thirtieth week, when the lower uterine segment begins to develop. If a patient is in a hospital or nursing home the obstetrician may not employ radical treatment in managing a case of placenta prævia, but in a private house such delay is unjustifiable. Where the os is partly dilated, the rupture of the membranes and podalic version are indicated. With complete dilatation, forceps may often be used. They believe it desirable that such cases be made hospital cases, and they fear Cæsarean section because the uterine scar may rupture in subsequent labor.

They consider accidental hemorrhage the best description for bleeding from a normally situated placenta. They do not mention toxemia as a cause, believing that it is not an important factor and that its claims have been pushed too vigorously. They lay stress upon that form of hemorrhage in which a certain amount of clot is retained although there is some free hemorrhage. They regard the outlook for the child in accidental hemorrhage as hopeless in most cases. If the uterus is contracted they would rupture the membranes. The Rotunda method of packing is advised. Cæsarean section and occasionally hysterectomy is permissible in some cases, but the best method for results has been the use of morphine and pituitary extract.

In dealing with lacerations of the genital tract they advise immediate closure of the torn cervix and give a good illustration of this procedure. They do not believe that rupture of the uterus often happens because of degeneration of the uterine muscle. They urge decapitation to prevent uterine rupture in transverse positions. Where rupture occurs, abdominal section should be practiced, if possible, and as soon as possible.

In treating of the accidents and injuries to the child, they have faith in the administration of chlorate of potassium to prevent intrauterine fetal death. They question whether many cases of apparent asphyxia are not really intracranial hemorrhage. Their method of resuscitation is to place the child in a warm bath, pull the tongue forward, and alternately press the chest and allow it to expand.

They rely upon nitrate of silver in the prevention and treatment of ophthalmia, although many in this country have found that argyrol in 20-per-cent solution is better. Cold applications are not mentioned.

They think it very important that record be made of the size of the uterus daily after delivery. They would sponge the external parts with an antiseptic solution instead of pouring, as is done in this country. No precautions are taken during the puerperal period to avoid retroversion.

The incomplete preparation of the field of operation is the cause in most cases of puerperal infection. Sapremia they call putrid endometritis. This they treat by scraping the interior of the uterus with the gloved hand and irrigation.

In septic endometritis they would make cultures from the interior of the uterus and go over its surface with a large blunt curette, followed by irrigation. They have little faith in serum, but would give one dose of the mixed variety while waiting for a vaccine.

In septic peritonitis, vaginal hysterectomy and clamping the broad ligaments give greatest promise of success. In dealing with septic complications following labor, they make no mention of signs in the chest in the beginning of thrombosis, although these signs are present and are valuable.

Appendicitis complicating pregnancy requires prompt operation and gives, usually, good results. Salpingitis is also an indication for operation. It is impossible to say whether in cases of influenza a bad result was due to the pulmonary condition or because the infection extended to the abdominal organs.

In treating subinvolution they regard ergot and hot douches as of greatest value, and they recognize the fact that secondary postpartum hemorrhage indicates the retention of placental or other tissue.

The section on infant feeding is practical and does not differ essentially from that in American text-books. Nipple shields are apparently not used. Pasteurized or sterilized cow's milk is advised and various artificial feedings.

The section on Obstetric Operations gives a full description of these procedures. They do not use a table but a couch, upon which the patient is to be placed, and ascribe great importance to what is termed "the washing and disinfection of the vagina" when the head of the child is high in the pelvis. They endeavor to carry out the same technique which the general surgeon employs. The forceps of Milne Murray they consider the best. Where uterine action ceases during labor, with conditions favorable for delivery, they would not give opiates but would proceed to the extraction of the child. They would use forceps only in the slighter degrees of generally contracted pelves. Mercurio's position is illustrated and described as Walcher's.

Symphysiotomy and pubiotomy they consider often very useful in generally contracted and kyphotic pelves.

They would rarely perform Cæsarean section in eclampsia, and in general, when dealing with contracted pelves with a true conjugate 3¼ inches or less, they would perform Cæsarean section if the child were living, and craniotomy if the child were dead; also for fibroid tumors obscuring or blocking the birth canal. For accidental hemorrhage they prefer other methods. They do not say whether they eventrate the uterus in Cæsarean section, but the impression is given that they do not, although their illustration shows the uterus turned out of the abdomen. They warn against making too small an incision and tearing the uterus afterward. The Porro operation they do not mention: for specific conditions they would remove the entire uterus. For sterilization they excise a portion of the Fallopian tube, burying the uterine end in the broad ligament. Silk stitches are passed through the whole thickness of the uterine wall, except the mucous membrane, in the conservative operation. The operation by lower uterine incision they illustrate but do not advise nor reject it. They question the wisdom of subjecting patients to Cæsarean section upon whom attempts at delivery by forceps or craniotomy had previously been made, because of the maternal mortality (27 per cent). Cases operated on late in labor, in their experience, show a mortality of 10 per cent; they would choose craniotomy under these conditions.

In our experience, septic cases treated by section and hysterectomy leaving the stump outside the abdomen have not a high mortality, and where a patient has been long in labor before operation, if the uterus be drained by gauze the mortality, in our experience, has not been large.

It is said that the induction of premature labor was recognized and practiced by British obstetricians in 1756. With others they select a true conjugate of 3½ inches in dividing their cases. They rarely induce labor upon a primigravida: use bougies, separating the membranes before their introduction, believing that sulphate of quinine or small doses of pituitrin (1/3 cc) night and morning given for two or three days prior to the operation, are very useful. Material obsolete with American obstetricians is introduced in this book in describing accouchement forcé, including, as the writers do, vaginal Cæsarean section. We had supposed that the latter was not a forcible procedure, and was accomplished by incision of the tissues rather than by forcible dilatation.

Bossi's dilator is illustrated, and the statement made that it has fallen into disuse. It has long since been considered unworthy of mention in this country; de-Ribes's bag is the type illustrated and recommended. Manual dilatation of the cervix is illustrated, and so is vaginal section.

The writers believe that craniotomy should be done more frequently than is the custom and that embryotomy is very frequently indicated.

In describing the intrauterine douche,

they illustrate one of the most dangerous and, with us, obsolete instruments in obstetrics, the so-called Bozeman-Fritsch-Olshausen-Kelly intrauterine douche tube. It is almost impossible to properly clean and disinfect this tube, and it has long since been abandoned for very simple tubes of glass, which are more efficient and far more safe. For intrauterine douching they prefer biniodide or bichloride of mercury.

The connecting chapter between Obstetrics and Gynecology is of interest. The writers state that septic infection and undue haste in delivery are the most important causes furnishing material for gynecology. They find that 95 per cent of uterine cancers are cervical, probably originating in tears of the cervix, often produced by the unskilful and premature use of the obstetric forceps. The relative importance of obstetrics and gynecology in the minds of the writers may be inferred from the fact that they give to the former 609 pages and to the latter 360 pages. They believe that there is a close relationship between the two subjects, and that they have kept constantly in mind in preparing the volume.

The Gynecology which they include in the volume is concisely given, well illustrated, and based upon conservative judgment. In dealing with the menorrhagia of adolescents they agree with us that curetting is of little value; that in some cases removal of portions of the ovaries is useful and that most of these cases yield to medical and hygienic treatment. They do not mention radium in this connection, but if the ovaries are properly shielded the *x*-rays may be applied with benefit.

Prolapse of the uterus, they believe, is usually caused by injuries to the tissues around the cervix. Premature application of the forceps and the dragging of the fetal head through the tissues is often a cause. For various types of prolapse surgery is the only curative method. Pessaries are of little or no value.

Backward displacements of the uterus are fully treated, and the use of the uterine sound to replace the uterus is advised and illustrated; the knee-chest posture is not. In this country replacing the uterus by a sound has been abandoned.

For anteflexion, Dudley's is said to be the best known operation.

In treating vaginitis, one-per-cent lactic acid is useful for its local effect. In cystitis, mercurochrome is not mentioned under that name.

Specific infections are clearly described and well illustrated.

In dealing with endometritis the writers would give ergot to control hemorrhage, and if this failed would perform curetting, examining microscopically the material thus obtained. In metritis, curetting is of no value, but *x*-ray and radium are usually efficient.

A full and interesting account is given of fibroids, and it is stated that radiation is one of the most valuable measures in arresting hemorrhage. If a suspicion of degeneration is present or if pressure symptoms have developed, operation is to be performed. Operation is useful in more cases and is more efficient than any other method of treatment. Where the fibroids complicate pregnancy the mother should be carried to full term without interference if possible. If there is evidence that the fibroid is degenerating or that its pedicle is becoming twisted the tumor, if possible, should be removed. It may be necessary at viability to perform Cæsarean section and hysterectomy. Where labor is complicated by fibroids, if the conditions are such that infection has probably developed, craniotomy should be chosen instead of Cæsarean section.

In dealing with cancer, they emphasize that vaginal hemorrhage in a woman over forty should be considered due to malignant disease unless this can be positively excluded. Where pain has developed, the condition has usually spread too far to be removed. Radical removal of the uterus, tubes, and ovaries, with a dissecting extirpation of the surrounding tissue, is the only method which provides a chance of recovery in cancer of the uterus. Where the

uterus is fixed by massive infiltration of the surrounding tissues, the case is inoperable. Nothing but free dissection of the cancerous uterus is of value. In those cases which cannot be treated by operation, *x*-rays and radium are the best means of controlling hemorrhage and sepsis.

Ovarian growths are very fully described and illustrated, and the differential diagnosis of these conditions is recognized as often difficult. Exploratory incision is frequently advisable where ovarian tumors complicate pregnancy; they should be removed so soon as they are recognized. The risk of abortion increases after the fourth month. During labor, if an ovarian tumor can be pushed above the pelvic brim and labor can proceed without difficulty, such should be attempted; otherwise the tumor must be removed by operation; in some cases Cæsarean section should precede its removal.

In dealing with salpingitis the writers are conservative but recognize the fact that where the condition is chronic, permanent relief can only be secured by operation.

Pelvic peritonitis and cellulitis they consider very important, and they give this subject careful attention. In their experience, spontaneous resolution usually occurs. Where pus accumulates it should be evacuated. Convalescence may be prolonged, but most of these cases recover.

They recognize the importance of injuries to the urethra occurring during labor, especially during unskilful delivery by forceps.

Hemorrhoids, in their experience, are best treated by ligation. Persistent hemorrhage indicates the necessity for operation.

The section on gynecological operations is concisely and clearly written. Picric acid is, to-day, the favorite antiseptic because its use avoids the irritation often caused by iodine. In disinfecting the vagina an alcoholic solution of biniodide of mercury, 1:500, is thought best. Throughout the book the writers recommend biniodide of mercury as the best antiseptic; for disinfecting an ulcerated cervix, scraping, radium or the thermocautery is advised. In most cases they use the Trendelenburg position for operation.

Gloves they use dry. They are sterilized by washing and boiling, dried, dusted with sterile powder, put into a sterile cotton case, and then sterilized for a half-hour. They much prefer the dry glove. They illustrate fully various matters of technique, and on the question of drainage they are conservative, but where the pelvis should be drained a free incision into Douglas's pouch is best. Vaginal section they seldom employ. To relieve thirst after section, small quantities of saline in the bowel at two- to four-hour intervals are efficient. They lay great importance upon a thorough and adequate convalescence. In their observation upon surgical shock they believe it is a very complex phenomenon and that it cannot be explained by paralysis of the vasomotor center only. Shock and hemorrhage and delayed shock are fully described.

Under the title "Delayed Chloroform Poisoning" they describe a toxic absorption occurring after the use of chloroform. It is very rarely seen except when chloroform is employed, and it is best treated by giving sodium bicarbonate by mouth and glucose and sodium bicarbonate by bowel.

In dilatation of the cervix they prefer Sims's branch dilator to the solid dilators which we mostly use.

Plastic operations are well illustrated, and under this head appear those for backward displacements of the uterus. The Alexander-Adams operation and Gilliam's are described, together with others.

Vaginal hysterectomy and extirpation of the uterus through the vagina are concisely described and clearly illustrated. In dealing with ovarian tumors, the writers would not tap the tumor before delivering it through the abdominal incision.

Editorial

THE TREATMENT OF DIABETES.

As is usual when a new remedy which undoubtedly possesses great power if properly used is brought forward, a large number of persons jump to the conclusion that a certain cure of a hitherto desperate state is rendered fairly certain. It is becoming increasingly evident that insulin in this respect differs in no way from many of its predecessors, and there seems to be already a good deal of divergence of opinion as to its dosage and as to its efficiency. These facts in no way impair its reputation in cases to which it is suited, but bring home to us the old story that one patient differs from another not only in his response to remedies, but as to the question of his symptoms as well. As illustrative of two opinions, which while not contradictory are nevertheless not strictly in accord, the following excerpts from recent publications are interesting, it being only fair to state, however, that the first excerpt is afterward guarded by the further statement that the use of insulin does not obviate the need of dietary control and that hypoglycemia induced by its employment must be carefully avoided.

The first excerpt, by Allen, states that "the discovery of insulin has opened a new era of diabetic treatment. In particular, the extreme privations of diet, which were formerly necessary in the severest cases, are now avoidable. Also, a much higher proportion of patients with dangerous acidosis or actual coma can now be saved. The treatment of infectious or operative complications is made more efficacious. Altogether, the possibilities are that the patient who is willing to take reasonable care of himself need no longer fear diabetes. There is good hope not only for life but also for comfort, and even in the severest forms it is ordinarily possible to build up the weight and strength and restore the ability to work and to lead an approximately normal life."

The second excerpt, by Wilder, is to the effect that there is little reason to believe that insulin will materially affect the underlying metabolic fault in diabetes; in fact it is possible, as certain observers maintain, that the better nutrition which the use of insulin permits may hasten the progress of the underlying disease more than formerly under régimes of under-nutrition, and, further, the statement is made that it is highly probable that patients with the acute type of diabetes will, in a few years, lose all their native tolerance and become completely diabetic. Wilder then proceeds to state that he wishes to emphasize this probability because of the necessity of recognizing the prospect of having gradually to increase the daily dose of insulin and also because it will necessitate the insuring of an uninterrupted supply of insulin to such a person.

Finally we may quote the following sentence which is pregnant with possibilities: "When patients have been kept alive by insulin long enough for their native tolerance to evaporate completely, their diabetes will be complete or total, such as has never been encountered in the past, and if, therefore, they are deprived of their quotidian injections, for ever so short a time, acidosis will develop with remarkable rapidity, and neither fasting nor careful dieting will avail to protect them." In other words, the persistent use of insulin in these cases, by saving the remaining islands of Langerhans from making any effort, is thought to induce a condition of inactivity on their part which will be permanent.

Of course, another view may be held, to wit, that if a certain number of the islands are destroyed and a certain number are weak, the use of insulin by affording the crippled ones a degree of rest might work to their benefit, as rest of these islands by starvation has heretofore been supposed to do.

All of this goes to emphasize the important fact that the dietetic management of diabetes is still the prime necessity. Under some circumstances, however, Wilder points out that it is necessary to

establish a tolerance for at least 100 grammes of glucose per day, and this might necessitate the injection of 100 units per day. In any event, it is manifest that we should give enough insulin to control acidosis, and Wilder points out that this may require from 60 to 100 units daily in equally divided doses at six-hour intervals, and that under these circumstances it is wise to give three ounces of orange juice with every 20 units of insulin injected. Usually it is considered that for each 40 grammes of sugar passed in the urine, 25 units of insulin are required, but according to Wilder's idea, in the presence of acidosis this proportion should be somewhat increased, since three ounces of orange juice contains approximately 30 grammes of carbohydrate.

For further information in regard to the use of diet and insulin when some intercurrent infection arises during the course of diabetes, we refer our readers to an abstract of Wilder's article, which appears in our Progress columns in this issue.

IMMUNO-TRANSFUSION.

Those of us who have tried to keep abreast with the times are fully aware that since transfusion of blood has been surrounded by safeguards it is resorted to a thousand times where previously it was employed once. It is also well known that an attempt has been made to treat cases of severe bacteremia by the injection of the blood of a donor belonging to the same group, with the hope that such blood might contain substances which would enable the patient to overcome his infection. The results obtained by this method have not produced the improvement desired in the majority of the cases, although occasionally the report has been favorable.

The proposition has been brought forward that it might be possible to increase the natural protective or curative powers of the donor blood by previously injecting into his body various vaccines, and as long ago as 1919 Wright advocated the transfusion of immunized blood, the immunization, however, being produced by the addition of the vaccine to the blood of the donor *in vitro*. Manifestly this method can only develop immune bodies, or factors active in the destruction of living germs, in the comparatively small amount of blood which is utilized, and prevents direct transfusion. It has therefore been proposed to carry out the more obvious plan of calling into play all the protective power of the donor's body by the injection of a vaccine, and Colebrook and Storer, of London, have carried out a series of tests, making their report from the Inoculation Department of St. Mary's Hospital. The points which they attempted to determine were whether an individual patient ought to be treated by inoculation of vaccines or by immunotransfusion, the best method of immunizing the donor's blood, the question as to whether defibrinated blood should be used, and if used, how it should be prepared and employed. Again, whether such defibrinated blood, or blood prevented from coagulating by sodium citrate, can be kept any length of time without losing its value.

It would appear that direct transfusion from the donor who is immunized, and in whom antibody and complement have been increased by inoculation, promises the best results, and the investigators that we have quoted have found that within one to five hours after the subcutaneous inoculation of a normal individual with various pathogenic germs the blood acquires a considerably increased bactericidal power.

It is an interesting fact that these observers believe that various germs have no definite specific effect, staphylococcus, streptococcus, and the bacillus typhosus all seeming to act in about the same way.

The bactericidal power of the blood of the donor seems also to vary with the dose of the vaccine, and Colebrook and Storer state that when they used 1000 millions of staphylococcus vaccine satisfactory results were obtained in every instance four or five hours after the inoculation and sometimes sooner. This increased bactericidal power of the donor's blood generally disappeared after forty-eight hours, and sometimes after

twenty-four hours, and if very small doses of streptococcus vaccine were used the increased power was already waning after five hours.

These statements are important, because some persons have thought that several days should elapse between the inoculation and the use of the blood of the donor.

In the concluding portion of their paper, Colebrook and Storer state that for several months they have adopted the routine procedure of inoculating the donor subcutaneously with 1000 millions of stock staphylococcus vaccine which they have obtained from Parke, Davis & Company, and then drawing off the blood of the donor within four or five hours. They state that 100 millions of typhoid vaccine is apparently just as effective, but will occasionally induce a slight febrile disturbance in the donor.

Finally, a word must be said as to the relative values of defibrinated or citrated blood as compared with whole blood.

These authors claim that the addition of sodium citrate, ammonium oxalate, or sodium phosphate to normal blood in amounts sufficient to prevent clotting considerably reduces its power to kill staphylococci and streptococci, the result being brought about in their opinion by impairment of some of the functions of the leucocytes. They therefore believe that decalcifying agents reduce the value for the purpose of immuno-transfusion, the more so as unaltered blood has lost none of its leucocytes, whereas in defibrinated blood a large number of them are enmeshed in the fibrin clot. Notwithstanding this fact, they apparently think that the leucocytes are not so important as one would imagine, and come to the conclusion that in practice it matters little or nothing whether we use unaltered blood or defibrinated blood. For this reason they prefer to use the defibrinated blood since it can be carried from one point to another. Nevertheless, if the opportunity arises when it is possible to bring the donor, after he has been immunized, side by side with the donee, we believe that direct transfusion by one of the recognized methods should be the method of choice.

A NOTE ON THE VALUE OF OXYGEN BY INHALATION.

Many years ago the editors of the THERAPEUTIC GAZETTE carried out a research to determine the value of oxygen in the resuscitation of animals poisoned by carbon monoxide. At that time oxygen had been little used for this purpose, and while it had been employed in all types of pneumonia it had failed in the majority of cases to do much good, chiefly because its method of administration was incorrect in that the gas was allowed to escape beneath the mouth or nose of the patient so that a very large part of it was lost, all of it being dissipated on expiration and a relatively small amount being taken in on inspiration.

Where an evil result is threatened in pneumonia because of profound toxemia, it is evident that oxygen inhalations can do little good, but in those cases of pneumonia in which a very large area of lung is involved and the degree of toxemia is not great, oxygen possesses distinct promise. In the experiments to which we have referred for the resuscitation of animals poisoned by coal gas, it was found that oxygen was of very great value provided it was supplied to the animal in concentrated form, the period of resuscitation when it was used being half as long as when it was not employed.

Since this research a multitude of other investigations have been carried out to determine the value of oxygen in carbon monoxide poisoning, notably by Yandell Henderson and Haggard, and it has been pretty well proved that in human beings as well as in animals such inhalations are of the greatest possible value.

It has also been shown that the simultaneous use of carbon dioxide with the oxygen in the proportion of eight to ten per cent causes the elimination of carbon monoxide from the blood about five or six times as fast as does normal air, and it is pointed out in the United States Public Health Reports of September 7, 1923, by Sayres and Yant, that pure oxygen causes the elimination of carbon monoxide about four

times as fast as normal air when breathed by persons who have been gassed until 35 or 40 per cent of the hemoglobin in their blood has been combined with carbon monoxide. In other words, the combination of the two gases is more efficient than oxygen alone, the addition of the CO_2 acting as a stimulant to the respiratory center and so increasing the depth of respiration with the consequent intake of a larger quantity of oxygen, and also inducing a greater rapidity of respiratory movement.

At the present time it is manifest that except in areas where carbon monoxide poisoning is prone to occur, as, for example, in connection with mines, no supply of CO_2 will be at hand, but that where it is at hand it should be employed. Whether it should be added to oxygen in the treatment of pneumonia is yet, we believe, undetermined.

The point to be borne in mind is that oxygen is useful, since cases of carbon monoxide poisoning in closed garages are by no means uncommon. In such cases a soft-rubber catheter, well oiled, should be passed through the nose, on one side only, and a free stream of oxygen allowed to flow through it, as under these circumstances the patient will be able to receive atmospheric air and plenty of oxygen as well.

THE EFFECT OF DIGITALIS IN CARDIAC FAILURE.

Readers of the GAZETTE will recall that on more than one occasion we have been bold enough to take issue with no less an authority than Sir James Mackenzie as to the effect of digitalis in cases in which arrhythmia and auricular fibrillation does not exist. We did this because a fairly large experience had impressed upon us that digitalis was a most valuable drug when there was no interference with the normal movements of the heart so far as regularity was concerned, but in which cases the heart seemed unable to perform the work which was necessary. For these reasons we have read with much interest a paper which was recently read before the St. Louis Medical Society by Luten. After discussing some of the well-known facts in regard to the influence of digitalis upon the heart, and quoting no less an authority than Lewis, who seems to be in accord with Mackenzie, Luten takes exception to this view because it limits the therapeutic use of digitalis to cases of auricular fibrillation.

We think that every practitioner of large experience will recall cases in which small tonic doses of digitalis given over a considerable period of time have been of marked value where there seemed to be cardiac feebleness, as during convalescence from acute illnesses. Not only is this true, but we think it is also a fact that in many instances where the electrocardiograph reveals evidences of myocardial degeneration, digitalis produces a marked improvement in the circulation, not because it possesses any power upon those cardiac fibers which have undergone degeneration, but because it increases the power and nutrition of those fibers which still are capable of performing their normal function. This necessarily means that digitalis in cases of myocardial degeneration cannot be expected to work miracles if the degeneration is very severe, but it is evident from our own experience and from the results reported by Luten that even where evidences of failure of the circulation are severe, digitalis, at least in some cases, is capable of producing excellent results, provided only that the patient is put at rest so that he can increase his cardiac reserve. The diminution in dyspnea, the increased flow of urine, the disappearance of albuminuria, the lessening, or disappearance, of edema, are all clinical manifestations of improvement, and the electrocardiograph likewise records the fact that the cardiac action has been bettered.

As we have also pointed out on previous occasions, the question of dosage is one which can only be determined by the physician for each individual case. In some

instances there can be no doubt that one or two massive doses should be given at the start. In other instances moderate doses continued over a long period of time will produce the best results. Luten goes so far as to claim that patients with myocardial insufficiency improve under this drug at about the same rate as do patients who suffer from auricular fibrillation, and he also emphasizes a point, which we think deserves more consideration than it is receiving at present, namely, that it is more dangerous to give massive doses than some recent writers would seem to believe. The fact that doses far in excess of those which used to be considered the maximum have been given in certain cases with excellent results has led to the feeling on the part of some physicians that digitalis is a safer drug than was heretofore considered to be the case, and that, therefore, less care need be exercised in its employment. This is an error.

There is one condition of myocardial insufficiency which may or may not be due to degeneration of the cardiac fibers in which we think digitalis will often fail, namely, that occurring during the course of the acute infectious fevers, when it has been long known to fail to slow a heart and often to fail to notably increase its power. Possibly some of the active toxins of the disease antagonize or exaggerate the effects of digitalis at these times, but this has nothing to do with the question of what can be accomplished by digitalis after the acute disease is over and we wish once more to restore cardiac strength.

In a recent issue of the London *Lancet*, Harrington Sainsbury, known very well to the older generation of medical men, discusses this interesting point, and emphasizes the fact that many years before Mackenzie's clinical investigations, such noteworthy therapeutists as Ringer, Balfour, and others, while not knowing that such a condition as fibrillation existed, nevertheless discovered that full doses of digitalis were useful in what Sainsbury calls flickering asystole of the auricle. Sainsbury also takes the view long held by most other therapeutists that digitalis by its influence upon the heart muscle, as well as upon the vagus, is of great value under many conditions, and insists that the drug is a powerful agent in increasing cardiac power of contraction, advancing anatomical, physiological and therapeutic reasons for his belief. He combats those of Sutherland, who recently stated that he doubted if the contractile power of the heart muscle can be improved and increased by the direct action of drugs. Our own feeling is that the medical profession is so firmly convinced that Sutherland is wrong and Sainsbury is right that Sutherland's views will receive little support. Indeed, in our opinion, they deserve notice chiefly because they are so heterodox.

BIRTH INJURIES.

In previous numbers of this journal there have been abstracted a number of papers abundantly proving that intracranial bleeding incident to birth trauma, either instrumental or due to the maternal efforts to expel the fetus, is common; that such hemorrhage associated at times with injury of the vertebra is a usual cause of still-birth, or neonatal death; that when not promptly fatal it is a cause of muscular incoördination and deficient brain power manifesting itself later in life; and that in its lesser degrees it is by no means improbable that the blood may disappear without leaving any obvious symptoms.

Little in 1861 contributed a valuable paper "On the Influence of Abnormal Parturition, Difficult Labors, Premature Birth, Asphyxia Neonatorum, on the Mental and Physical Condition of the Child, Especially in Relation to Deformities."

Spencer some thirty years later, on the basis of 130 consecutive autopsies on fresh and usually still-born fetuses, noted that congestion or edema and hemorrhages are usually found in various important viscera most frequently and most severe in chil-

dren subjected to pressure in the parturition canal by instruments. Cerebral injuries were found oftenest in forceps-delivered still-born children.

Next in their frequency they were found in those born by the breech. In the *Proceedings of the Royal Society of Medicine* there is a discussion on this subject which Lockyear preludes by a reference to the work of Spencer.

Holland is impressed by the frequency of intracranial injury and hemorrhage as causing still-birth and infantile death and as constituting the underlying factor, in infants which survive, of orthopedic and neurological conditions which may and frequently do cripple through life. He adduces figures which prove convincingly that from 20 to 50 per cent of still-births and neonatal deaths can be attributed to cerebral hemorrhage, which may be subdural, in the ventricles, or in the substance of the brain, and often occur in more than one place. Most of the cerebral hemorrhages are found in the ventricles, on one or the other side of the tentorium cerebelli, into this structure or beneath it. These hemorrhages are regarded by Holland as not all of traumatic origin, he attributing to asphyxia a certain percentage. The traumatic hemorrhages often show a tearing of the tentorium. It has been shown that such hemorrhage may occur incident to a perfectly normal delivery, evidenced, Cameron states, by a bulging fontanel, blood-stained cerebrospinal fluid, and by rigidity or spasticity of the limbs, sometimes associated with trismus, or even local convulsions, or twitchings, especially in the face or eye muscles. There may be somnolence, slow pulse, and disturbance of the respiratory rhythm. If these symptoms in marked degree are present the prospect of life is slight.

It cannot be doubted many children suffering from moderate cranial hemorrhage exhibit symptoms so slight as not to be noticed. The question arises as to whether in these cases there will be later manifestations of damage. It is well known that at first only those nerve paths essential to life are medullated, and that there is little or no voluntary control of the skeletal muscles during the first few months of life; hence it would not be for a year or even more that the lack of control incident to central injury would be observed.

Children with these intracranial hemorrhages show slow development from the sensory motor side. The mentality may be above the average. Ultimately muscular control may reach a degree of precision which could not be anticipated from the early symptoms. They develop somewhat abnormally on the psychic side, but do not in the least resemble those cases of spastic idiocy incident to congenital neuron deficiency.

From the neurological standpoint Collier notes that the discussion of the cause for spastic states and the relation of difficult birth to these dates from the time of Cruveilhier in the early days of the nineteenth century, who stated that autopsies performed on asphyxiated babies will show meningeal hemorrhages in one-third of the cases and that these hemorrhages are the cause of the asphyxia, the hemorrhage in the new-born being caused by the trauma of delivery.

Weyhe is quoted to the effect that of 1000 consecutive autopsies on children dead before the fourth month from any or all causes, meningeal hemorrhage was found in 12 per cent. It seems well proven that 60 per cent of all cases of infantile spastic states dating from birth have a history of some abnormality in the process of parturition. Collier quotes Little to the effect that the disease he (Little) describes, which is characterized by spastic states, is the result of an asphyxia which causes minute hemorrhages throughout the nervous system which in turn are followed by sclerosis and wasting.

It cannot be doubted that difficult labor may tear the brain of the infant and this in turn be followed by the formation of cicatricial tissue and of cyst formation. Collier regards birth paralysis as clinically rare,

holding that most cases of severe injury to the brain perish promptly. As to the ultimate fate of children who survive cerebral hemorrhage incident to birth injury, he reports having seen patients with porencephaly which might have been due to hemorrhage, but who exhibited neither physical nor mental impairment. He believes the usual cause of porencephaly is embolism or thrombosis.

Fairbanks speaking of birth palsy reports on 98 cases. As to the mechanism, he advocates the traction theory, meaning by traction the position which uptilts the head away from the shoulder, putting a strain on the upper cords of the brachial plexus. The direct pull on the arm he regards as the exceptional cause. This form of palsy is commonest in head presentations, usually, but not always, attended by difficult labor. Exploration has in some cases shown the injury to be intraneural. He notes that under proper treatment signs of recovery appear in about three months, most of these cases recovering more or less completely. The treatment consists in holding the arm in such position as will keep relaxed the muscles affected, supplemented by massage and joint movements. Exploration is indicated if there be no sign of recovery in from three to six months. Secondary suture after excision of the cicatricial portion of the nerve is indicated. Nerve grafting has been without favorable result. In untreated cases there will be a posterior subluxation of the shoulder-joint. Thirteen such cases have been seen by Fairbanks. They can usually be treated successfully by conservative methods.

Bearing on the question of hemorrhage into the brain stem, Lumsden, as the result of an extensive laboratory study, refers to four respiratory centers. He holds that when the normal type of breathing persists in the presence of an intracranial hemorrhage the brain stem is necessarily uninjured.

Strachan accepts the belief that bleeding usually comes from the tributaries of the vein of Galen. His studies show that intracerebral hemorrhage is rare, and he corroborates the findings of others to the effect that tentorial laceration is eight times as frequent in breech presentations as it is when the vertex comes first. In a case that lived but two days, twitchings, inability to suck, drowsiness and deepening coma were the most prominent symptoms.

Aitken speaks with some regret of the little use of the neurologist in the treatment of spastic paralysis, and alludes to the case of a child five years old who was regarded as an idiot. After section of the nerves the child in two days was able to speak short sentences and had lost his twitchings.

From this discussion it is obvious that many neonatal deaths are avoidable by greater skill on the part of the obstetrician not only in regard to the actual manipulations, but in regard to the wisest decision as to when intervention is needful and as to what form it should take. Cæsarean section is now becoming a comparatively safe operation. It also seems clear that the infantile spastic palsies developing in children who survive are some of them due to birth trauma. It is by no means demonstrated that the majority of them can be traced to this cause.

Collier argues, and somewhat convincingly, that most spastic states are of prenatal origin, basing this not only on his clinical experience, but upon extensive autopsy studies.

ANESTHESIA.

Progress in Medicine and Surgery sometimes goes by jumps, sometimes so slowly that it is not perceived as progress until one reviews, for instance, the literature of ten or twenty years ago. Thus insulin represents a brilliant advance. The same may be said of a number of phases of cranial, thoracic and abdominal surgery, and of the treatment of malignant growths by radiation.

In the meantime anesthesia has been undergoing a slow evolution, leading to

lessened suffering, more efficient surgery, and lessened mortality. The day of chloroform is past. The day of ether going, the day of nitrous oxide and oxygen, perchance supplemented by other narcotic and anesthetic agents, is here. The day of local and regional anesthesia is coming.

This advance in anesthetics and their use is incident in the main to a corps of trained anesthetists, those who devote all their time and attention to this important branch of the medical art, and who, by their observation, their studies and their clinical experience have gradually settled upon safer agents and more efficient instruments for the abolition of the pain sense and the securing of that muscular relaxation needful for the performance of many surgical operations. Nor have they been unmindful of the comfort of the patient and the lessening of undesirable sequelæ.

The dropping of ether as a major factor in inducing anesthesia has been slow because even in unskilful hands it is comparatively safe and is almost universally available; also from the surgeon's standpoint it is highly efficient. The introduction of nitrous oxide has been equally slow because it requires an apparatus; and, of major import, one experienced and skilled in its use and the interpretation of its results. It is swift in its effects, little harmful in its after results, but used by one unskilled it is for the purpose of general surgery perhaps the most dangerous anesthetic we have.

Connell believes that the collection of not only the reported but the unreported deaths incident to the use of nitrous oxide would probably show at the present time that its mortality exceeds that of ether.

Considering the anesthesia of the future, to-wit, that of infiltration or nerve blocking, the slow progress toward its general adoption is incident not to a lack of efficiency when properly applied, nor to its almost absolute safety, but to the failure on the part of the profession to devote the necessary time needful for the acquirement of anatomical knowledge bearing on the distribution of nerve trunks, and the manipulative skill essential to the proper application of the drug of choice, at or near the position where it is designed to accomplish its desired end. Moreover certain instruments are required other than the usual hypodermics of varying size.

To the young surgeon particularly, and to him of larger experience who would keep abreast, or even lead, in the progress of the day, training in local anesthesia represents a most profitable asset. There is practically no region in the body which cannot be obtunded against pain. There is practically no operation which cannot be accomplished painlessly under local anesthesia if the patient exhibit the normal or nearly normal psychology of the majority of people.

There was reviewed in the August, 1923, number of the THERAPEUTIC GAZETTE a book by Farr, who as the result of the routine and successful use of local anesthesia in all his operations has been enabled to set forth in complete detail his armamentarium, his methods and his growing belief in its practically universal application. Farr holds that he who cannot do an operation painlessly under local anesthesia should not hide behind the veil of preliminary narcotism, using only when he so does the hypodermic medication as a preventive measure against psychic shock.

The induction of general anesthesia is now largely entrusted to nurses, and they do it well. Since local anesthesia requires a certain degree of time, and failure to recognize this has been responsible for many of its alleged shortcomings, it can be expected that in a large clinic patients will be brought to the operator with the anesthesia well developed. It is not probable, however, that this will be done by nurses, but rather by doctors with thorough anatomical knowledge and skilled in the methods of injection. Knowledge of local anesthesia and of its safe and efficient methods of induction is as useful to the general practitioner as it is to the surgeon, since it will enable him to reduce fractures

and luxations, clean and suture wounds, and indeed carry out many minor surgical procedures without giving his patients pain or subjecting them to a general anesthetic. One who can do this and acquire reputation for so doing will receive a profitable approval from his community.

As to the drug of choice, that at the present time seems to be novocaine in from one-half- to two-per-cent solutions. Cocaine, except for surface application on the mucous membranes, has been practically discredited. Though it is prompt, long lasting and deeply penetrating in its action, constricts the smaller blood-vessels, and exhibits a minimum of devitalizing action on tissues, it is too unstable to allow of sterilization by boiling and is extremely toxic. Dixon *(Proceedings of the Royal Society of Medicine,* June, 1924) states that a local anesthetic is another name for a general protoplasmic poison, and notes that an anesthetic thirty times as powerful as cocaine, namely eucuprinotoxin, is useless, because whilst it destroys the functions of nerve fibers it also injures other tissues and is lacking in selective power.

Bearing on the question of toxicity of the local anesthetics, Watson-Williams has shown that it is possible to so dilute cocaine that it becomes entirely non-toxic, but this dilution is below the limit of clinical usefulness. He believes that the non-toxic dilution of novocaine is about a quarter of one per cent. He finds that it is impossible to kill a guinea-pig by a subcutaneous dose of this strength, and probably impossible to kill a human being by practically any quantity of such a weak solution injected beneath his skin. Novocaine used in the usual strength, even though injected in large quantities, is without dangerous effect.

Progress in Therapeutics

Medical Therapeutics

The Treatment of Impetigo Contagiosa in Children.

SMITH and BURKY, in the *Johns Hopkins Hospital Bulletin* for March, 1924, state that an ointment of ammoniated mercury of one-third of the usual pharmacopœial strength has been used in the routine treatment of impetigo in the Harriet Lane Dispensary during the past ten years. It has been efficacious except in a small proportion of the cases. In the latter the lesions have continued to spread for ten days or even longer. No explanation for this difference in behavior could be found until the cases were studied bacteriologically. Five of the six patients, from whose lesions streptococci were isolated, were cured in an average of one week apiece. In the sixth patient the lesions healed rapidly, but the disease continued to recur, until an autogenous streptococcus vaccine was given. The three patients from whom staphylococci were isolated proved to be very resistant to treatment. New lesions continued to form and the area of involvement grew larger even when covered with mercury ointment. It required an average of three weeks each to cure these patients. It was not possible to predict with any degree of certainty from the type of lesion observed whether the cultures would contain staphylococci or streptococci. After applying ammoniated mercury to the lesions for forty-eight hours one could predict the results with assurance. If the lesions had practically disappeared, the cultures would contain a streptococcus.

whereas if there was but little improvement or an actual extension of the disease, a staphylococcus would be found.

It became necessary to search for a more efficient method of treatment for those cases with which staphylococci were associated. Argyrol, silver nitrate, zinc sulphate and yellow oxide of mercury were tried without success. Then it was decided to try gentian violet, because Churchman had shown that this dye was highly bactericidal for staphylococci in the knee-joints. They used a 5-per-cent solution of gentian violet in 20-per-cent alcohol. The unruptured vesicles were opened, old scabs removed, and the entire area painted with a swab saturated with the gentian violet. The stain dried very quickly. Then the painted area was covered with a thick layer of mild ointment, such as vaselin or boric acid ointment, and bandaged. The bandage was allowed to remain undisturbed for two days. When removed, it was found that most of the excess of gentian came away with the ointment, leaving the lesion only slightly stained.

Seven cases were successfully treated by this method. These seven cases were not included in the series of ten described above because the organisms recovered in the majority of these cases came from broken vesicles. In six of these seven cases the cultures contained staphylococci and the other one streptococci. The average length of time required to cure each of these seven cases was six days. To make the test as conclusive as possible, both gentian violet and ammoniated mercury were used simultaneously on each of these patients. After cultures had been taken, one-half of the lesions were covered with ammoniated mercury ointment and the other half painted with gentian violet and covered with sterile vaselin. The whole area was then bandaged for forty-eight hours. At the end of this time, in all six cases from which staphylococci had been isolated there was marked improvement in the area treated with gentian violet, while the part covered with ammoniated mercury showed little or no betterment. The gentian violet was then applied to both sides and recovery resulted in from three to five days. In the one case from which streptococci were isolated the two sides recovered at about the same rate. From this they conclude that gentian violet is equally effective as ammoniated mercury in the treatment of impetigo associated with streptococci, and much superior to it in the treatment of staphylococcus impetigo.

Gentian violet is not irritating to the skin in the concentration used. The patients never objected to it being applied, even on a raw and tender area. No toxic symptoms were ever observed from absorption of the drug, although in one case the painted area was fully one-fourth of the surface area of the body. In addition to killing the organisms, the gentian violet seemed to have a specific stimulating effect on the regenerating epithelium.

It is important always to apply some kind of ointment over the gentian violet to keep the surface moist and to prevent scab formation.

The Treatment of the Emergencies of Diabetes.

WILDER, in *Minnesota Medicine* for January, 1924, states that it cannot be too strongly emphasized that the advent of an infection always demands not less but more insulin, and that large doses of from 15 to 25 units may be needed every six hours, so long as the infection continues. As in the case of uncomplicated but total diabetes, the interval between doses must be brief, and the daily dose must be divided and administered in three or four equally spaced injections.

It is important to use carbohydrate fairly liberally. Fruit juices are well tolerated, and contain sugar in an especially available form, in large part as fructose. It is considered that orange juice contains ten parts

of carbohydrate. He makes it a rule to administer by mouth 100 gm. of orange juice with every 20 units of insulin injected, and has found that in toxic cases this amount of carbohydrate will satisfactorily buffer the insulin and at the same time supply the sugar necessary to counteract ketosis. Besides the carbohydrate of the orange juice, such soft foods as the patient will accept, especially milk, cream, and eggs, are given. However, the total carbohydrate ingestion should not exceed 100 gm. daily. It does not seem necessary or desirable completely to avoid glycosuria at such times; the control of acidosis is primary. Every effort is made to prevent the accumulation of acetone bodies.

Despite fairly large doses of insulin and adequate carbohydrate, an exacerbation of the infectious process may at any time provoke sudden acidosis. It is, of course, extremely helpful to have at hand the laboratory facilities for examining the blood for the carbon dioxide capacity of the plasma, but in the absence of such facilities the respiration of the patient is a reliable indication of the state of the alkali reserves. Air hunger, the long deep "Kussmaul" type of respiration, is a sure sign that the stores of alkali are depleted, and such breathing, if accompanied by a strong acetone smell and other definite clinical evidence of acidosis, is an indication for giving soda. The disrepute into which sodium bicarbonate has fallen is undeserved. An intravenous injection of 500 cc of a 6-per-cent sodium bicarbonate solution will immediately affect a critical acidosis, and to neglect its use in such an emergency is unjustified. Insulin and carbohydrate may accomplish the same result as soda, but the delay entailed may tip the balance unfavorably. Severe diabetic acidosis is dangerous, and should be controlled as rapidly as possible.

When the infection subsides, the patient's native tolerance, which has been temporarily suppressed, returns in part at least, and the necessity for large insulin doses passes. It is then important to reduce these doses in order to avoid overaction and insulin shock. It is usually possible to return gradually to the diet and dosage which were effective before the onset of the complications.

The Treatment of Nephritis.

In the *Lancet* of March 1, 1924, MACLEAN writes that the treatment of subacute or chronic nephritis resolves itself almost wholly into considerations of the general régime and suitable diet. Complicated and puzzling as chronic nephritis may be from the clinical standpoint, modern research has shown that there are two quite distinct types of the disease, and that these two types can frequently be differentiated by renal tests.

In one type the characteristic and prominent symptom is edema; there is frequently a difficulty in excreting water and salt, but no difficulty whatever in excreting nitrogenous waste products. This hydremic type is always associated with the presence of a very large amount of protein in the urine.

In the other variety of renal disease there is frequently no hindrance to the passage of water and sodium chloride, but a distinct failure to excrete nitrogenous waste products. The urine in this azotemic type frequently contains but a very small amount of protein; unlike the hydremic variety, it shows a marked tendency to be accompanied by cardiovascular complications, and sooner or later, if the patient survives, uremic manifestations set in.

Before deciding on the line of treatment to be adopted in these different lesions it is essential to ascertain what the nature of the condition present in any patient really is. This information is best obtained by the use of modern renal tests. If a patient suffering from extreme renal edema shows a favorable blood-urea concentration, and gives good results with the other tests, there can be no doubt that the best treatment is to put the patient on a good diet composed largely of protein. Often this increased diet may, with advantage, be combined with 10 to 15 g. of urea given by mouth twice daily. This dose may be kept

up for a week, when it should be left off for a few days, to be continued at intervals for other short periods if necessary. It is wonderful how rapidly the edema sometimes disappears with such treatment; in other cases one must admit that the results are disappointing, but when this is the case it will generally be found that the patient is not suffering from a pure hydremic condition, but shows evidence of azotemic or interstitial disease as well.

In hydremic cases not very much can be done by means of hot air and other hot baths. In this type of case they are frequently dangerous, and cardiac failure, in his experience, is by no means a rare accident. They should never be used if there is any suspicion of cardiac weakness.

The diet in chronic interstitial nephritis must be guided by the extent of the lesion and by the state of the renal function. When the case is a very advanced one, the usual low protein diet is probably best, but in many patients experience shows that the present custom of prescribing a very low diet often does harm. In such patients a marked improvement in general health can frequently be brought about in a few weeks by allowing a good diet containing a fair amount of protein. No doubt the tendency to anemia, so marked in many cases of renal disease, is frequently due to an insufficient diet, and probably more harm is done in the milder forms of nephritis by the poor diet alone than by the renal disease itself. On the whole, the tendency now is to feed our nephritic patients rather better than we did, and not to restrict protein too much unless the condition is really advanced.

Rectal Examination in the Conduct of Labor.

In the *Journal of the Missouri State Medical Association* for March, 1924, WILSON writes that any method in the conduct of labor which will reduce the number of vaginal examinations will reduce the chance of infection to the same degree. In 1893 Ries and Kronig recommended rectal instead of vaginal examination in labor. The method was little used until a few years ago, when the coming of rubber gloves brought it into popularity for pelvic exploration in labor. Its usefulness has steadily increased from the simple determination of the advancement of the head to a recognized method in all phases of obstetrical practice.

Fully 95 per cent of all normal labors can be conducted without vaginal examination. Antenatal pelvic measurements have, of course, to be made. Abdominal palpation, frequent auscultation of the fetal heart-tones and exploration of the pelvis by the rectal finger give the required information concerning the progress of labor. The size of the cervix, its position and amount of effacement and dilatation; the degree of engagement, the presenting part, breech or cephalic, hand or footling, brow or face, anencephalous, hydrocephalus, prolapsed cord, placenta prævia, the presence of the bag of waters, abortion in progress, can all be diagnosed without vaginal invasion as the rectal touch becomes more acute.

The technique is simple. The rubber glove is slipped on the hand corresponding to the side of the patient from which the examination is to be made. Lubricant is placed on the index-finger. In approaching the anal orifice it is best to bring the finger from below upward to prevent soiling the perineum. The external hand presses the presenting part down from above the symphysis. The relaxed sphincter during labor presents little resistance, and if gently done little pain is felt. After a short time the finger becomes educated and the rectal findings are as clear as per vaginum.

Should rectal examination fail to reveal the desired information a vaginal examination can be made as a control after the proper external preparation.

In the out-patient department of the Chicago Lying-in Hospital and Dispensary, where thousands of women have been confined in tenement homes, this method has been almost exclusively used. There has been a marked decrease in the number of postpartum temperatures since its introduction. In both hospital and out-patient cases

the interns are given instructions in making rectal examinations as follows:

(1) Head or breech? Or what? (2) Position of presenting part? (3) Is the presenting part engaged? (4) Where is the cervix? How much effacement and dilatation? (5) Is the bag of waters ruptured? (6) Is the cord prolapsed? Are any other anomalies present? (7) If there is no engagement, why not? (Contracted pelvis, tumor, scars, placenta prævia?)

The advantages of the method are: It is simple. It is quick. It is practically painless. It can be used in 95 per cent of normal labors. It removes one danger in the event of Cæsarean section. It earns for the physician who uses it a justifiable ease of conscience in the event of a postpartum temperature.

The Difference in Pharmacologic Action of Potassium and of Sodium Salts When Administered Intravenously.

In the *Journal of Laboratory and Clinical Medicine* for March, 1924, LOESER and KONWISER report that, translated into practical therapeutics, their experiments indicate that when an iodide effect only is desired, sodium iodide should ordinarily be chosen for intravenous administration. Osborne has recently shown that, when administered by mouth, potassium iodide seems to be utilized by the body in the form of sodium iodide. Only a slight amount of potassium was absorbed. It would seem that the intravenous route is far more direct and satisfactory than the alimentary canal route if one uses as his criterion the speed and efficiency with which a drug is utilized, and the accuracy with which it may be administered and controlled.

The fact that potassium is comparatively toxic when introduced into the vein suggests that we may have a very valuable therapeutic agent in potassium, once its action is fully understood. That the toxic symptoms are not the result of the mode of administration, but rather an expression of the pharmacological action of the drug, is shown by the fact that the same symptoms are elicited when a sufficiently large dose is given by mouth. The work of Mathison and of Macht shows that potassium should be decidedly useful in such conditions as hypertension. Moreover, in view of the fact that many of the newer cancer theories favor the substitution of potassium for sodium as far as possible, clinical investigation on the action of potassium intravenously should prove of great value and interest.

They believe that potassium salts are far more toxic intravenously than the corresponding sodium salts.

The action of a drug intravenously must be carefully studied; it cannot be inferred invariably from its action when administered by mouth.

When the effect of the iodide radical is desired, sodium iodide, rather than potassium iodide, should be used intravenously. When the potassium effect is desired, potassium iodide is naturally chosen. In that event the dosage must be carefully regulated.

Reinflations in Artificial Pneumothorax Treatment.

BURRELL, in the *British Medical Journal* of March 1, 1924, states that the importance of rest in the treatment of active tuberculosis is well recognized. Rest of the body and of the diseased part, followed by training of the body and rest of the diseased part until the lesion has healed, is now a common method of treatment. In pulmonary tuberculosis the lung can best be rested by artificial pneumothorax. When a lung is collapsed no special skill is required to put a needle into the pneumothorax cavity and inject gas. But it is only by experience that the amount of gas, and when it should be given, can be judged. A common mistake is to give a definite quantity of gas at definite intervals. Not only does the rate of absorption vary considerably in different individuals, but the optimum degree of collapse also varies. Moreover, the same

patient may require more or less gas at refills as the treatment proceeds.

When starting pneumothorax treatment he gives small frequent refills until the lung is well collapsed. He likes to get a good collapse after about a fortnight and some five or six refills. He then finds the degree of collapse which is best for the individual patient. Some require full collapse and others do much better when the collapse is less complete. We have next to discover how long the optimum degree of collapse will last without a refill; this is best done by means of *x*-rays. If the patient does not do so well when the intrapleural pressure is higher than —2 cm. water, any further collapse of lung causing such symptoms as dyspnea and loss of weight, it can be seen by *x*-rays how much collapse of lung there is at this pressure, and by frequent screening when the lung begins to reëxpand. If it is seven days the refills should be given weekly; if four days, then two refills a week are required. If, when the refill is due, the intrapleural pressure is –12 cm. water, then we know that the optimum pressures are between –2 and –12 cm., and the correct quantity of gas to give is that which will raise the pressure from –12 to –2 cm. By this means the lung is kept completely at rest; it is not collapsed beyond the optimum degree, and the intrapleural pressure is never allowed to reach that stage at which reëxpansion occurs. As time goes on it is usually found that the gas is absorbed less quickly and so longer intervals can be allowed between the refills. The object is always to keep the lung at rest.

Sometimes large refills (1000 or even 1500 cc) are given at long intervals. In these cases the lung is completely collapsed and then allowed to reëxpand before the next refill. He calls these concertina cases, because the lung is alternately expanding and collapsing. As a rule in such cases the patient complains of dyspnea and discomfort just after the refill; this is followed by a period of well-being, and this again by a period of increased symptoms before the next refill. Most of these patients lose weight; some, however, remain well, and this is usually because the disease is arrested and the treatment may safely be discontinued.

The difference between individuals is very considerable. Burrell saw a patient recently who had been having 1500 cc of gas every five weeks. He had been having artificial pneumothorax treatment for over two and a half years, felt well, and was free from symptoms. The lung had completely reëxpanded five weeks after the last refill; 600 cc of air left a pressure of –6 cm. water, but it caused very good collapse. After two weeks there was not much reëxpansion, but a week later the lung had expanded considerably. In this case, to keep the lung at rest 500 or 600 cc of gas should have been given every fortnight. However, as he kept so fit even when the lung was expanded it seemed that the disease was arrested, so he stopped the refills, and he has remained quite well. On the other hand, absorption may be very slow. In one case there was practically no reëxpansion of lung twelve weeks after the last refill, and the lung had not completely reëxpanded after six months.

X-rays are of the very greatest value, but, if not available, an attempt must be made to ascertain the optimum degree of collapse from the signs and symptoms. If a patient says he feels ready for a refill it usually means that the interval between the refills has been left too long, for a refill should be given before the patient begins to feel the return of symptoms. Again, the temperature is often a guide. Vital capacity is also of use in judging the optimum degree of collapse. After a refill the vital capacity is diminished, but if small refills are given the diminution should be very small. If the vital capacity is taken daily it will be found that at first it improves after a refill and then remains constant for a time. After this it will be found to diminish slightly, and the refill should be given before this diminution begins.

Adhesions may prevent a satisfactory collapse of lung, and it may be so great that the treatment has to be abandoned. It may, however, be decided to continue the refills

in the hope of stretching the adhesions and so making an efficient pneumothorax possible. In such cases very high pressures are not needed, for better results are obtained by giving frequent refills, leaving the intrapleural pressure constant and thus keeping a steady pull on the adhesions.

When fluid develops during pneumothorax treatment the gas is less quickly absorbed, so that the lung often remains collapsed for a long period without a refill. It is usually wise, however, to remove the fluid and replace it with gas, because if it is left adhesions are almost certain to form.

Sometimes, though only a partial pneumothorax is obtained owing to adherent pleura, it is sufficient to relieve the symptoms. Usually in such a case the pneumothorax cavity is gradually obliterated by contraction of the adhesions and increase of adherent pleura. In such cases the refills should be continued as long as possible, for the diseased lung becomes fibrotic and the patient often does very well. It is useless to continue the refills if there is so much adherent pleura that an efficient pneumothorax cannot be obtained. It may happen during treatment that the disease begins to spread in the other lung, and in this case the refills should be stopped. The patient then usually improves, so that it may be said that the pneumothorax aggravated the disease. But cases are often to be met with in which the disease is spreading rapidly and steadily, and after an artificial pneumothorax has been induced there soon appears a spread on the other side. On stopping the refills, however, there is improvement on both sides, although the patient is kept on exactly the same treatment as before the artificial pneumothorax was started. It seems, therefore, that it is really the pneumothorax which checks the spread of the disease.

In conclusion, he lays emphasis on two points: (1) It should be remembered that the object of the treatment is to rest the lung, and that therefore the lung should be rested and not alternately collapsed and expanded. (2) It is not necessary to compress the lung fully; a very satisfactory collapse can be obtained with the intrapleural pressure still negative, and harm is often done by giving too large a refill.

Special Indications for the Use of Quinidine.

PARDEE, in the *Journal of the Medical Society of New Jersey* for March, 1924, reminds us that the treatment of patients with the irregular heart of auricular fibrillation has had a new phase revealed by the discovery of the action of quinidine. Quinidine is not a heart stimulant or tonic drug. It is, in fact, a depressant to the cardiac muscle, but it has the peculiar ability of being able to abolish auricular fibrillation, so that the previously irregular heart beats again as by a normal mechanism. The return to normal rhythm takes place in somewhat more than half of all patients who have auricular fibrillation, but some relapse again to the irregular action in a few days or hours, so that for practical purposes the treatment is effectual in about 40 per cent of the patients. If a patient remains with normal rhythm for a week or ten days before relapsing to auricular fibrillation, it is usually possible by a further course of quinidine to return the normal rhythm in from twenty-four to thirty-six hours, and it may persist this time for seven to ten days or more, or less. Some patients retain the normal rhythm for weeks after quinidine treatment and some for months or years.

The present state of our knowledge is so incomplete that we cannot say in advance whether a given patient will return to normal rhythm or not, or if he does, how long this will remain. On the average a favorable reaction to quinidine is not as frequent in patients with advanced valvular disease or patients with large hearts, as in those without valvular disease and without cardiac enlargements, but the individual patient often fails to follow the average behavior of the group. Many with much enlarged hearts or advanced valvular disease or both can be returned

to normal rhythm by quinidine, and some will retain this for a considerable time. He feels that at present every patient who has auricular fibrillation should have a trial with quinidine to see whether his heart cannot be returned to normal rhythm, for the patient is nearly always more comfortable with the heart beating regularly.

There are certain dangers connected with the use of quinidine which should be clearly in the physician's mind in order to, as far as possible, avoid them. One danger lies in the fact that it is a depressant to the cardiac contractility, which results in a certain degree of weakening of the cardiac force in any patient to whom it is given; this effect only rarely causes an appreciable degree of cardiac failure during the administration of the drug, but it represents an influence which tends to be harmful rather than beneficial. In addition to this, quinidine tends to produce in certain patients while under treatment a very rapid ventricular rate. If this rapid rate is long persisted in, it will lead to a greater or less degree of cardiac failure, from fatigue of the muscle. There are thus these two factors—the toxic action on the muscle and the rapid rate—which tend to cause cardiac failure during the quinidine treatment. These patients must be watched while under treatment for signs of the onset of failure, or for an increase in the signs already present. If quinidine is seen to be doing harm in this way, it should be promptly stopped, for Pardee has seen very serious failure result from continuing the drug after it had become evident that it was causing decompensation.

This tendency to cause decompensation should not amount to a serious danger, for it is easy to avoid if care is used. The one serious danger from quinidine is the possibility of sudden death. This occurs very infrequently, in less than one per cent of patients, but when it has once happened there is no redress. It is believed to be due to cerebral embolism, the clot coming from the interior of the left auricle. During fibrillation of the auricles they remain in the diastolic position, so that clots would tend to form because of stasis in the dilated auricular appendix. These clots are sometimes pushed out into the blood stream when the auricle begins to contract normally.

For this reason we should never attempt the quinidine treatment at any time less than four weeks after a period of severe decompensation. During these four weeks any clots that may have formed in the auricles will have become adherent, so that they will not be so readily thrown into the circulation. Furthermore, the four weeks' treatment with digitalis will improve the condition of the circulation, and thereby the nutrition of the muscle of the auricles, and by this will probably tend to favor the return to normal rhythm. Pardee has, on several occasions, found a second course of quinidine to be successful when it was given two or three weeks after an unsuccessful one, and has often found the second course to result in a longer period of normal rhythm than the first. He attributed both these results to the improved condition of the auricular muscle which resulted from the additional period of improved circulation.

Ventricular fibrillation may on rare occasions be a cause of the sudden death during quinidine treatment. Ventricular tachycardia has been observed in patients under quinidine, and in dog experiments ventricular fibrillation itself has been noted. We do not know what predisposes to this, but it seems likely that the better the condition of the muscle the less the chances would be. This is an additional argument in favor of getting the heart in as good condition as possible before trying the quinidine.

The danger from the use of quinidine must be contrasted with the dangers of continuing to have auricular fibrillation. The danger is slight if the patient is faithful in following out this digitalis treatment so that his heart-rate can be controlled by this. Occasionally sudden death occurs in

these patients, due to cerebral embolism, and occasionally they have emboli in the arteries of the extremities or the abdomen. Many of them have a more or less unpleasant sensation in the chest due to the irregular heart action, and all of them must take digitalis throughout their life.

During the initial treatment with quinidine, patients should be in bed and under close observation, but a patient who has once been returned to normal rhythm by quinidine and relapses to fibrillation again need not be so closely watched nor so closely confined during a second treatment. The first treatment should be preceded by a test dose of 6 grains of quinidine sulphate to see if the patient has marked suceptibility, as shown by buzzing in the ears, headache, nausea, or general weakness. If not, then 6 grains every four hours should be given on the next day, giving four doses for the first two days, and if normal rhythm has not resulted, giving 5 or 6 doses daily thereafter. The patient should be seen every day and watch kept for signs of intoxication. It is hardly worth while to continue the treatment for more than six days in all, for those who return to normal rhythm after as much quinidine as this are not likely to continue with it long before reverting to fibrillation.

Sometimes the patient's reaction to the drug will demand its withdrawal. Palpitation, which is very marked, headache, nausea, vomiting or diarrhea may appear and indicate a harmful effect of the quinidine, or, as has been already mentioned, signs of decompensation may appear to be increasing.

Whenever the patient returns to normal rhythm, and usually he is able to realize this, the quinidine should be discontinued for that day. A dose of 6 grains should then be given every morning and night for several days following, as a prophylactic against the return of the fibrillation. The patient may now be allowed out of bed as soon as his state of compensation and general health warrant it.

The Treatment of Pyelitis in Infancy and Childhood.

In the *Archives of Pediatrics* for March, 1924, FREEMAN states that the accepted methods of treatment of this condition are of two sorts. It has been well established that by alkalinization of the urine and keeping it alkaline persistently for several days a cure can be accomplished in most cases. For this purpose bicarbonate of soda, preferably in solution, in doses of from 5 to 20 grains every hour day and night, or every hour during the day and a double dose at bedtime and 10 P.M. and possibly at 2 A.M., is usually successful.

Another preparation to produce alkalinity, which is used at the Roosevelt Hospital when bicarbonate of soda alone is not effective, is the administration of calcium carbonate, bicarbonate of soda, and burned magnesia, five grains each, every two or three hours. There are some cases, however, in which Freeman has found it impossible to alkalinize the urine.

When alkalinization is used as much aid as possible should be elicited from a proper regulation of the diet, for it has been shown that a vegetable diet favors an alkaline reaction in the urine. Herbivorous animals have alkaline urine. In addition, certain fruits are effective in this way, such as oranges, raisins, apples, and bananas. Tomatoes are not of value, while meats and cereals increase acidity, and plums, prunes, and cranberries, on account of their content of benzoic acid, also increase acidity.

In order to form any intelligent opinion as to what is being accomplished by the treatment it is necessary that there should be in the nursery a supply of litmus paper, and that each passage of urine should be tested with the litmus paper. This paper should be pinned on a sheet stating the time when the urine was passed, such papers being kept in chronological order and brought to the physician with the specimens of urine. In this way only can the physician judge if sufficient alkalinity is being obtained, whether such alkalinity is being

kept up day and night, and if not at what period the child needs greater alkalinity of the urine.

In what manner alkaline treatment cures many of these cases we do not know. Alkaline treatment was first emphasized by Thompson of Edinburgh, a very reliable observer, and Browning states that "the change in reaction bathes the tissues in a more bland fluid and thus enables them to combat the infection more effectually."

Helmholz, who tried experiments to inhibit the growth of bacteria with an alkaline medium, found the greatest alkalinity obtained in urine to be ph. 8.6, while the colon bacillus is not inhibited by less than 9.2 or 0.6. He also tried the effect on the bacteria of changing rapidly from an acid to an alkali and back to acid, but no difference was observed.

His results, however, in this treatment are so often quickly satisfactory that we should persist in the alkaline treatment as the most effective and safest treatment we have.

A second method of treatment, often promptly effective when the procedure just discussed is not, is an effort to sterilize the urine by hexamethylenamin. Occasionally a brilliant result may be promptly obtained with small doses, although Helmholz, in his experimental study, concluded that, on account of the length of time required to produce formaldehyde from hexamethylenamin, that is two hours in order to kill 90 per cent of the bacteria, this has no value in the pelvis of the kidney as the urine rarely remains in the bladder more than one and a half hours. Thus, even if a sufficient amount of hexamethylenamin is given, it is almost impossible to obtain a bactericidal concentration on account of the lack of time.

Again, in this treatment we must not be discouraged by Helmholz's findings, as it does cure the disease. In order to obtain a favorable result the urine must be acid. The urine, however, is normally acid and in most cases no aid need be resorted to, excepting avoidance of alkaline medicine, and such modification of diet as is favorable to continued acidity, this diet consisting, if the child is of appropriate age, of the use of cereals, meat, eggs, and of fruit only plums, prunes, and cranberries.

If, under these conditions, the urine is not acid the use of benzoic acid or acid sodium phosphate or dilute hydrochloric acid may be resorted to.

Hexamethylenamin should always be started in very small doses, only one-half grain under one year of age, one grain in children under three, and not more than two grains in children from three to five years of age. It may be given in such doses three times a day if well taken, and the dose increased daily until large doses are given, these large doses often curing cases that are not affected by the smaller doses. He has given as much as a drachm a day to children under one year of age, but only after watching the effect of the smaller doses on such a child for several days. In using the acid treatment the same careful control by litmus paper, as used in the alkaline treatment, should be resorted to, and daily microscopic examination of the urine made.

Organotherapy in Addison's Disease.

ROWNTREE, in the *Journal of Pharmacology and Experimental Therapeutics* for March, 1924, states that in the summer of 1921, Dr. Muirhead, Professor of Pharmacology at the Creighton Medical School, an early investigator of the adrenal gland, came to him for treatment of Addison's disease in an advanced stage. After a conference in which the possibilities of treatment were thoroughly discussed, a régime of forced treatment was decided on, namely, the administration of adrenalin and of desiccated whole gland, to the limit of tolerance. Adrenalin was given hypodermically and by rectum three times a day, and the whole gland by mouth three times a day in doses which represented maximal tolerance. After six months the results of treatment were published by Muirhead in

the *Journal of the American Medical Association*. The subsequent course and fatal outcome was published by him (Rowntree) in the same journal later.

The form of treatment, called the Muirhead régime, has been tried since in a series of cases of Addison's disease, with results of sufficient interest and value to warrant presentation in the hope that it will be subjected to a more intensive clinical trial.

From the standpoint of treatment the patients may be classified into three groups: (1) four not treated; (2) five treated with some form of specific glandular therapy, but not a full Muirhead régime; and (3) nine treated with the full Muirhead régime. Of the patients in group I, all died within a few days or weeks of registration; in fact, one died before completion of the examination. Of group II all died. One whose disease was graded 3, received large doses of whole gland (10 grains three times a day) by mouth and 1 cc of adrenalin by rectum daily, and lived for sixteen months. Six patients of group III are living after eight months; and four, after one year to sixteen months. Of those who died, one (Dr. Muirhead himself) was greatly benefited for a period of months, while both of the others were definitely benefited for only a very brief period, succumbing within a month.

A closer investigation of these nine cases discloses several facts of interest. Each patient experienced subjective improvement. Occasionally a definite feeling of exhilaration followed a single injection of adrenalin. Several patients are again at work, some being restored to one-half to three-quarters efficiency. The pigmentation decreased materially in all, and to a remarkable degree in some. Improvement, if prolonged, was accompanied by a gain in weight, strength and appetite, by a decrease in gastrointestinal symptoms, and a moderate or slight increase in blood-pressure, averaging perhaps 10 mm. In all nine cases receiving the Muirhead treatment, improvement was evident within one week of initiating treatment. Individual tolerance varied strikingly for either both epinephrin and whole gland or for the hypodermic and rectal use of adrenalin. Individual tolerance is not constant for the individual case. Variations of considerable magnitude for each preparation and method of administration have also been encountered in some instances.

Intolerance for continued administration of whole gland by mouth has been encountered rather frequently, the patient complaining of burning in the epigastrium, intestinal cramps, abdominal distress or nausea following its use. Decrease in the size of the dose, or its omission for a period, has been necessary in some instances. This intolerance is less marked when the drug is taken on a full stomach, although no decrease in efficiency has been noted.

Adrenalin by rectum is effective, unquestionable increase in blood-pressure being demonstrated in some instances; tenesmus is apt to develop on the continuous use of large doses.

In one case in which there was a positive Wassermann reaction, and early nervous system syphilis, adrenalin was essential, since grave symptoms, an exacerbation of Addisonian manifestations, followed each dose of arsphenamine unless it was preceded by a hypodermic of adrenalin.

The best results have occurred in the patients with the greatest tolerance of treatment. An apparent intolerance of all forms of suprarenal treatment manifested itself in the more advanced cases, a shock-like condition developing. This is associated with high hemoglobin content, low blood volume, and extremely low blood-pressure. In two instances gum acacia was administered to combat the shock. Whether this condition is only a manifestation of the disease itself has not yet been determined, but in one or two instances it appeared to develop or to be intensified by adrenalin. This condition and, in it, the results of specific treatment, need further investigation.

The six patients still living are firm in the belief that the specific treatment is of

great value, and none of them is willing to forego it.

The treatment is a form of replacement, and thus far it has seemed necessary to make it continuous.

From the standpoint of prognosis adrenal insufficiency, *per se,* is not the only essential consideration, since the underlying disease, tuberculosis or neoplasm, is unaffected by the treatment employed.

The Treatment of Cervical Adenitis.

HOWARTH, in the *Lancet* of March 29, 1924, states that in the region of the neck there are so many sources of possible irritation that the most thorough investigation must be undertaken before any drastic treatment of the actual glandular enlargement is embarked on. The scalp must be examined for impetigo, seborrheic eczema, pediculi, and other lesions. The possibility of oral sepsis must be investigated, and carious teeth, alveolar periostitis, unhealthy tonsils, or ulcerative lesions of the fauces, tongue, and floor of mouth looked for. The ears must be examined for any evidence of discharge, whether due to infections of the external auditory meatus or to chronic suppurative otitis media, whilst adenoids must be looked for in the nasopharynx. It is not easy to say by which route the infective process more commonly enters, but it is probable that in the majority of cases in children, unhealthy tonsils and adenoids and carious teeth are responsible. It is quite remarkable, at any rate in the south of England, how the number of cases of extensive cervical adenitis has diminished since the teeth and tonsils have been properly attended to, so that it is quite unusual to see patients with large masses of glands in the neck, though this was quite a common sight twenty years ago.

That the tonsil is a portal of entry has been satisfactorily proved, and recently published investigations by Dr. S. R. Gloyne and himself over a series of 300 cases of unhealthy tonsils associated with cervical adenitis showed that the infecting organisms were mainly streptococci (hemolytic and non-hemolytic) and pneumococci, whilst the tubercle bacillus was only found in the tonsil in 5 per cent of the cases. If, as is probable, tuberculosis is a late and superadded infection, the most important factor in the treatment of chronic glandular enlargment, with a view to the avoidance of extensive operative interference, is the complete elimination of all primary foci of infection. If this is effected it will be found that in a large number of cases the glands subside and eventually disappear. Complete resolution should not, however, be expected always to take place immediately, and occasionally a year or more may elapse before the glands finally disappear. In slow cases especially, though it applies to all, good fresh air, preferably in the country or at the seaside (the latter usually better for adults), combined with the maximum of sunlight, together with the use of syrup of iodide of iron, are most useful adjuncts. It is doubtful whether any external applications such as iodine influence the course of resolution perceptibly. Although in a large number of cases the glands tend to disappear under the general treatment outlined above, there remains a residue of cases in which the enlargement of the glands persists.

This group may be dealt with either conservatively or radically. The exponents of conservative methods pin their faith to a carefully thought-out régime of sunlight and country or seaside air, metabolism being raised by graduated exposure to the open air and by sea bathing. Should a gland break down it may be dealt with by aspiration with a sterile needle and the application of pressure or the injection of bismuth or iodoform emulsion. Merely emptying the gland will, in many cases, cause it to subside. If frequent aspiration is likely to be necessary the use of a seton is sometimes advocated. This method is more commonly adopted in France, but recently has had its advocates in England. If this method is tried, a seton made of a double thread of strong silk, with the points of entrance

and exit at some distance apart, is probably best, and it may be left in for two to three weeks. At the end of this time suppuration has usually ceased and a cure is obtained, with the formation of very small punctiform cicatrices which are hardly visible. As a rule, however, broken-down glands heal satisfactorily if opened by a small incision, their contents evacuated, and the abscess very gently scraped. It should be drained, not packed, by a small ribbon of bismuth gauze.

X-rays have been found of great value in the healing of sinuses, often one or two applications being sufficient. *X*-rays are also particularly useful in enlarged glands where a good deal of periadenitis is present. Injections of tuberculin in properly graduated doses, at suitable intervals, have in some instances proved a useful help. There is no doubt that under such treatment as the above large numbers of cases of cervical adenitis have become perfectly well. Many of these cases had been proved to be of a tuberculous nature, and the fact that they were cured tends to show how remarkable is the natural reparative power of the body against tuberculous infection.

The advocates of the more radical method of treatment do not deny that by many methods of treatment improvement, and possible cure, may be brought about; but they are inclined to doubt whether such cures are permanent or the methods applicable to the more extensive cases the tuberculous nature of which has been definitely proved. They also maintain that the time of recovery would be shortened considerably by surgical treatment. In such cases more active surgical intervention is suggested as the alternative. Naturally, the extent of the operation must depend on the requirements of each particular case, but it should be the aim of the surgeon to get rid of the whole mass of infected glands as thoroughly and completely as possible. Incidentally, a clue may be afforded to the cause of the numerous cases of extensive disease occurring in a particular locality and the possibility of some form of preventive treatment being instituted. Some years ago an elaborate investigation by A. P. Mitchell showed that cow's milk containing bovine tubercle bacilli was clearly the cause of 90 per cent of the cases of tuberculous cervical glands in infants and children residing in Edinburgh and district. If such is still the case it is obvious that this source of infection could be dried up at once if the local authorities possessed and used proper powers for the control of the milk supply, or if all milk was sterilized before use.

It must not, however, be assumed that this explanation holds universally, and the extent to which the milk of tuberculous cows is actually responsible for the infection of mankind with tuberculosis is very variable in various places. Statistics on similar lines to those just mentioned give the surprisingly low figure of 4 per cent in Berlin, whilst in Italy the infection of human beings with tubercle bacilli of the bovine type is almost equally uncommon.

Be this as it may, the necessity of dealing with advanced cases of cervical adenitis of a tuberculous nature is still present. It is maintained by the advocates of helio-alpine treatment that progressive isolation in high alpine surroundings does produce remarkable cures even in advanced cases, and that large masses of indurated and adherent glands may be completely absorbed in six months, or where sinuses are present the whole infected gland may be extruded as a sequestrum, and the sinus rapidly heal with the formation of a supple scar. In this country, however, extensive surgical removal of the whole infected area provides the best chance of a satisfactory result. In the neck such a procedure may involve the complete dissection of the infected glands in the anterior triangle, but may also demand the sacrifice of the sternomastoid and the elimination of all the posterior group of glands lying on the splenius and levator anguli scapulæ muscles. Excellent results have been obtained from such drastic procedures as these, and the necessity

for them should not either be overlooked or dismissed.

In conclusion Howarth says that (1) all primary foci of infection (tonsils, teeth, etc.) should be eliminated and adequate time allowed for the subsidence of the secondary adenitis; (2) if this fails to occur, conservative surgical methods combined with general and special therapeutic measures should be tried; (3) in the more extensive cases a thorough and complete removal of the whole of the infected glands should be effected.

The Treatment of Functional Disorders of the Heart.

HUNT, in the *Lancet* of April 5, 1924, states that the only drugs of much value are the bromides, and they can conveniently be combined with arsenic. Drugs of the "tonic" type may contribute to the sense of well being, and may in this way be useful; probably none of them directly increases the patient's capacity for exercise. Various endocrines have been advocated, particularly thyroid, but there is no very definite evidence in their favor, and personally he has never been convinced of their usefulness. It has been clearly shown by Lewis and his coworkers that digitalis is useless.

It is not possible in a short space to give a comprehensive list of the various conditions which may aggravate the symptoms, much less to discuss their treatment. There are few diseases, even the mildest, whose effects are not reflected to some extent in the cardiovascular system, whether it is normal or not, and if observations are made on an individual's response to effort over a prolonged period, it is found that it is impaired by such trivial causes as a bad night or a slight headache. It is obvious, too, that a surgical disability, such as flat-feet, will cause an increase of pulse and respiration rate on exercise greater than normal by imposing a mechanical disadvantage on the muscles involved or by producing pain.

Certain conditions must, however, be particularly looked for, as being especially likely to contribute to the severity of the symptoms. Chief among these is septic absorption from such foci as the teeth, a nasal sinus, or even a "chronic appendix": he has known cases in which the eradication of a source of chronic infection has resulted in the disappearance of all cardiac symptoms without any further treatment. Any catarrh of the respiratory tract will increase breathlessness, but it is not so generally recognized what relief may be given by remedying structural conditions causing partial nasal obstruction.

Allusion has already been made to the important part played by defective vasomotor control, and the effect on the vagus of any kind of gastric disturbance. The treatment of any coincident dyspepsia must, of course, vary in different cases, but as a rule these patients should be advised to drink between and not with their meals, to restrict carbohydrates and foods leaving a large undigested residue, such as cabbage or lettuce. Restriction in this respect, however, must not be too rigid in patients with a tendency to constipation. Such patients should also be warned against taking exercise directly after meals, particularly if they are liable to attacks of fainting. Visceroptosis is another abdominal condition that may require treatment, particularly if it is associated with a weak abdominal wall, which allows pooling of the blood in the splanchnic area, with consequent starvation of other parts of the body.

Much discussion has arisen as to the part played by functional nervous disease in the production and aggravation of the symptoms, but probably most physicians would agree that while functional nervous disease may be associated with circulatory symptoms, circulatory symptoms by themselves rarely give rise to nervous symptoms other than anxiety about the state of the heart. It is important to assess the nervous factor at its proper value and determine in every case: (1) whether the only nervous symptom is anxiety about the state of the heart;

(2) whether the circulatory symptoms are primarily due to functional nervous disease, such as a general state of exhaustion; or (3) whether the nervous symptoms are simply an associated condition, possibly produced by the same etiological factors as the circulatory symptoms. The answer to these questions must profoundly modify treatment, notably as regards the advisability of rest in bed.

The Treatment of General Paralysis.

In the *British Medical Journal* of March 22, 1924, PURVES-STEWART states that a maxim in connection with the treatment of paralytic dementia—and one to which, in his opinion, sufficient attention has not been paid—is that the disease is essentially syphilitic, and that mere pyrexial treatment, whether by inoculation or otherwise, is not really attacking the cause of the malady. How, then, does malarial inoculation produce its beneficial effects? It does so mainly by the pyrexial reaction with its accompanying tissue changes—by a burning up, as it were, of some of the toxins affecting the cerebral cells, a sort of cleansing fire. But that the actual cause of the disease—the syphilitic encephalitis—is still uncured is demonstrated by the fact, repeatedly noted by von Jauregg and many other observers, that after malarial treatment, even when reënforced by energetic mercurial and salvarsan treatment, although the mental symptoms may clear up to a remarkable degree, the cerebrospinal fluid retains its pleocytosis and its positive Wassermann reaction. This is a fact of supreme significance, for so long as the cerebrospinal fluid shows syphilitic reactions it is obvious that the patient is still suffering from cerebrospinal syphilis, and that his cerebral symptoms may recur.

Some physicians have grasped this fact and have therefore followed up the malarial treatment by assiduous antisyphilitic treatment, by means of arsphenamine, mercury, etc. But in no recorded case, so far as he can discover, has the cerebrospinal fluid been restored by these methods to anything like its normal conditions. As a matter of experience, it has been found that the most energetic antisyphilitic treatment, whether alone or in combination with malarial inoculation, has hitherto failed to make any serious impression on this refractory variety of cerebrospinal syphilis.

His object is to call attention to an important modification of the malarial treatment, which he has carried out during the past year or two, whereby not only is a general paralytic patient freed from his mental symptoms, but his cerebrospinal fluid is restored to a normal condition, so that the pleocytosis disappears, and even the Wassermann reaction, most obstinate of all, may become negative. These results, it is submitted, are superior to those hitherto achieved by other methods.

Having selected for treatment patients in the earliest possible stage of general paralysis, in whom signs of profound dementia have not yet supervened, and who nevertheless show the usual changes in the cerebrospinal fluid, an intravenous inoculation of benign tertian malaria is given. After a short incubation period, varying from a day or two upward, the resulting malarial pyrexia comes on and is allowed to run its course, until the patient has had seven, ten, or perhaps even twelve successive bouts of benign tertian fever, depending on his general physical condition. Quinine treatment is then employed to cut short the malarial infection. Thereafter the patient is given a weekly intravenous injection of arsphenamine, neoarsphenamine, or perhaps best of all, silver-arsphenamine. At each alternate treatment—that is, once a fortnight—the patient's blood is withdrawn by venipuncture. From this an autogenous arsphenaminized serum is prepared and injected into the patient's subarachnoid space, after withdrawal of a corresponding amount of cerebrospinal fluid for purposes of control.

Hitherto it has been the custom, following the well-known technique of Swift and Ellis, to inject such serum into the lumbar

theca through a lumbar puncture needle. It is evident that only a small proportion of serum thus introduced finds its way upward into the cranial cavity and cerebral cortex, which is the region desired to be reached in cerebral syphilis. Some physicians have endeavored to facilitate upward diffusion by lowering the patient's head and elevating the lower part of his trunk for several hours after a lumbar injection, and encouraging results have been recorded by this method.

The improved plan he has adopted to supplement malarial inoculation is to introduce the serum directly into the cisterna magna and roof of the fourth ventricle by means of a suboccipital or cistern puncture, according to the technique of Wegeforth, Ayer, and Essick. Serum introduced in this situation flows forward with the current of cerebrospinal fluid to the basal cistern and thence upward to the cortical subarachnoid space, directly reaching the diseased cortical areas. He does not need to recapitulate the technique of the operation of cistern puncture, for which only three requisites are necessary—a knowledge of anatomy, a steady hand, and a stout heart. One of his critics, Dr. Farquhar Buzzard, at a meeting in which this procedure was discussed, humorously remarked that the stout heart is required by the patient as much as by the physician! But, as a matter of clinical experience, he has performed this operation many scores of times without the slightest inconvenience or ill effects to the patient. In fact the discomfort is usually considerably less than that which follows a lumbar puncture.

Weekly intravenous injections of arsphenamine, with fortnightly intracisternal injections of such serum, are carried out systematically as above described. Daily mercurial treatment by the mouth is also given throughout. The cerebrospinal fluid and blood are examined at every injection, and the treatment is continued not only until the clinical symptoms, physical and mental, have cleared up, but until the cerebrospinal fluid becomes normal, as evidenced by the disappearance of pleocytosis and by a negative Wassermann reaction. That this result can be achieved is shown by two cases which he cites.

Dehydration in Vomiting of Pregnancy.

HARDING, in the *Canadian Practitioner* for April, 1924, states that there can be no doubt that dehydration plays a part in many cases of nausea and vomiting of pregnancy. This applies particularly to the more severe forms where the vomiting may have continued for a period of some weeks. The dehydration is brought about obviously by the loss of fluid from the body, through the actual act of vomiting itself, combined with the inability of the patient to replace both that loss and the normal body loss of water, by the intake of fluid through the ordinary channels. The amount of fluid lost by vomiting will vary with the particular case, but he has measured as much as 1500 cc of vomitus a day. The clinical signs of dehydration are also very evident; the skin is dry and harsh, the lips are cracked, the mucous surfaces of the mouth and tongue are dry and coated. The patient usually expresses a desire to drink, but is either unable to do so or is afraid to satisfy her natural longings through fear of further increasing her vomiting.

Whilst the signs of dehydration are evident in the severe cases, it is not so generally known that dehydration is often present in milder cases of nausea and vomiting of pregnancy without the outward clinical signs being visible. Harding's attention was drawn to this fact by a study which he has been making on the kidney function in this particular pathological condition. It is known that many cases of vomiting of pregnancy show albumin in the urine; sometimes a few casts are also found. It has been his experience, however, that not only is albuminuria found in *some* cases of nausea and vomiting of pregnancy, but it is an almost invariable occurrence, although it may only be present in traces. It was his intention to discover

the cause of this albuminuria, and to see in what way the kidney function was failing, that directed his attention strongly to the importance of a free supply of fluids to this class of patient. The damage done to the kidney cannot in most cases be very great, for it usually happens than on recovery the albuminuria disappears, so that we should not expect to find any evidence of gross disturbance in most cases, and would therefore look for some test for kidney function which will be capable of finding small disturbances. It was evidently impossible from the nature of the case to use any test such as the water test, or a nephritic test meal, and he therefore had to rely upon an examination of the blood in order to find evidence of renal damage. The non-protein nitrogen and uric acid content of the blood offer a means of doing this; especially will the value for uric acid be of use as it has been shown that the content of this substance in the blood is a most valuable index of the extent of renal damage. Normally the blood of women in the early stages of pregnancy does not contain more than 3 mgs. of uric acid per 100 cc of blood. It is very rarely that we find this value exceeded. This value applies only to the early stage of pregnancy. Its normal value in other conditions may be a little higher. The value for non-protein nitrogen in early pregnancy rarely exceeds 30 mgs. per 100 cc blood, and again this value is to be accepted as valid only in early pregnancy.

The treatment of the severer forms of nausea and vomiting of pregnancy in the wards of the Toronto General Hospital has for some three or four years consistently followed one direction. Rest in bed with isolation is insisted upon. Glucose enemata of six ounces of ten-per-cent glucose in saline are given t. i. d. Usually for the first twenty-four or forty-eight hours thirty to fifty grains of sodium bromide are included in each enema. No food is given, but in spite of the fact that the patient at the beginning may be vomiting rather freely, fluids are urged by mouth to the extent of about sixty ounces a day. The fluids given by mouth may vary, indeed it is found that the patient will ask for variation. On some days water is given, on others weak lemonade or orangeade with a little sugar is supplied. Even weak tea may be given if the patient desires it. In this respect we humor the patient, allowing a free variety of beverages, provided she can be persuaded to drink them. Strong tea, coffee, cocoa or milk, however, are rigidly excluded at this period. The bowels are emptied daily by a simple enema in the morning. At the beginning of treatment, however, it may be advisable to give a high colonic irrigation or the use of a purgative on the first day. These measures are intended to overcome the three etiological factors which he believes exist in this condition.

Laboratory and Clinical Experiments with Certain Germicides.

YOUNG, WHITE, HILL, and DAVIS, in the *Journal of Pharmacology and Experimental Therapeutics* for March, 1924, state that some of the cases had mixed infections, and in these specific action was often marked. For example, chronic pyelitis, with colon and staphylococcus; after two intravenous injections of novarsenobenzol the urine showed colon only; after two injections of mercurochrome it became sterile, and remained so. In many of the cases with positive results the effect was striking. For example, in chronic pyelitis which had resisted other treatment (two cases) the urine became sterile within two hours after the injection, and remained so. Septicemia, bacillus coli, comatose and moribund, temperature 103°, temperature rose to 106° after intravenous injection; in six hours the temperature was normal, patient conscious, blood culture negative. He was discharged well in a few days.

They feel that for septicemia the largest possible dose should be used, and that repeated doses are probably of less value.

Doses used: Mercurochrome, 1 to 6.8 mgm. per kilogramme of body weight

novarsenobenzol, 0.6 to 0.75 gramme; gentian violet, 5 mgm. per kilogramme of body weight.

These experiments are preliminary in nature, but the authors feel that they demonstrate the possibility of intravenous chemotherapy, and hope that others will be interested to investigate along these lines.

The Effect on the Kidney of Treatment for Syphilis.

McFARLAND, in the *American Journal of the Medical Sciences* for April, 1924, states that the reaction of the kidney to mercury and arsphenamine, as employed in the treatment for syphilis, consists in what, according to Volhard and Fahr's classification, is nephrosis. The pathological condition is essentially a more or less marked degeneration of the epithelium of the renal tubules.

Urinary findings consist of hyaline or granular casts, albumin, pus, and erythrocytes.

Casts are the most sensitive indicator of renal irritation. They are usually first to appear and are more numerous than albumin or pus.

Erythrocytes should be rarely encountered in the urine of patients with normal kidneys under treatment for syphilis.

Lowering of the phenolsulphonephthalein excreting power of the kidney and elevation of urea in the blood are rarely encountered under treatment for syphilis.

In no case observed was renal damage sufficient to cause edema, headaches, nausea, impending coma, or other signs or symptoms of severe renal damage.

Practically all patients who have had a characteristic renal reaction to treatment, return to normal again if given sufficient time.

Arsphenamine alone, when properly prepared and given, causes only slight renal irritation.

Neoarsphenamine appears to cause less reaction than arsphenamine.

Mercury is by far the most important factor in renal irritation under treatment.

Whether mercurial inunctions or intramuscular injections of mercury succinimide are given, seems to make little difference in the time of appearance or extent of renal irritation.

The renal irritation resulting from combined arsphenamine and mercury treatment is practically equivalent to the sum of that produced by the two drugs given separately.

Approximately one month is the proper time to allow for the urine to return to normal after stopping non-cumulative mercurial treatment for syphilis.

Acute syphilitic nephritis must not be confused with acute nephritis in a patient with syphilis. The condition may so closely simulate true syphilitic nephritis that a therapeutic test with arsphenamine is the only means of reaching a diagnosis.

Patients with cord bladders, under treatment for syphilis, have very few casts in the urine. This may be due, in part, to disintegration of the casts in bladders with residual urine, but several facts seem to indicate that the kidneys of such patients are really less reactive than the normal ones, and stand intensive treatment fairly well.

Patients who have damaged kidneys, as evidenced by chronic nephritis, nephrosis, focal nephritis, and so forth, show a higher degree of reactivity to treatment than normal patients, but recovery seems to be quite as satisfactory.

Intercurrent infection, such as bronchitis or bronchopneumonia occurring in a patient under treatment, may cause an additional flare-up, but such a complication need not contraindicate future treatment from the renal standpoint.

There is a certain tendency for more severe reactions to occur as treatment progresses.

If sufficient time for recuperation is allowed repeated courses of treatment may be given, at least up to three or four, without causing significant renal damage.

Age is not, as such, a contraindication to treatment for syphilis.

There is a marked tendency for spontaneous recovery from the renal irritation.

even in the face of continued administration of the drugs.

General measures which may influence the toxic nephrosis, such as removal of foci of infection, alkalinization of the patient, and low-protein, salt-free diet, may be of some value in certain cases, although the results are not uniform nor striking.

Stopping the administration of mercury is the most effective means of bringing the urine back to normal. In view of the good prognosis with regard to the nephrosis, the mercury should not be stopped too frequently; the rest periods should be sufficient to control the situation.

The Treatment of Ringworm by Robertson's Method.

MANSELL, in the *Journal of the Royal Army Medical Corps* for April, 1924, states that not the least of the advantages of this method is the substitution of a feeling of cheerful confidence in place of the previous pessimism, almost amounting to dismay, with which one was wont to regard the occurrence of ringworm. The period of treatment is short; the amount of time required is only a quarter of an hour a day, and the prospects of a rapid and complete cure appear to be 100 per cent.

The treatment is performed as follows:

The hair of the whole head is cut as short as possible, and, if necessary, the areas affected are shaved. The scalp is then thoroughly washed with ether soap and dried. The following lotion is applied by means of a small pad of wool on a probe or forceps: calomel five grains, tincture iodi mitis one drachm, the mixture being stirred thoroughly with a glass rod until a brick-red precipitate is formed. Unless there is some special indication for treating only one portion of the scalp, it is best to decide to treat the whole, and for this purpose—as there is frequently some degree of reaction, more especially over active ringworm patches—the scalp is divided into six areas, one of which is treated with the lotion each day.

The lotion should be gently daubed on and not rubbed in, and it must be freshly prepared for each application. If it is applied at all roughly considerable pain and erythema—even blistering—of the part is apt to result. Care must be taken that the lotion does not run down from the scalp on to the skin of the face or neck.

The parts of the scalp which have not been treated with lotion are then well massaged with unguent. hydrarg. ammon., and the whole scalp is covered with clean lint and a bandage, or, better still, the parents are asked to provide three or four closely-fitting linen skull caps which can be easily washed and disinfected and are worn day and night.

The following day, when the covering is removed, those parts of the scalp which were not treated with the lotion on the previous day are carefully washed with ether soap, and the second area is treated with the lotion; the ointment is applied and the head covered as before; and so on, day by day, till the six areas have been treated.

If there is any marked or painful reaction to the lotion, the application of a mixture of three parts of olive oil and one part of castor oil usually clears it up very rapidly; and if the use of ether soap causes undue smarting, a freely lathering soap has been found to be quite efficacious.

After the head has been thus treated in areas with the lotion, the whole scalp may be given one final treatment all over in severe cases, but in ordinarily mild cases this has not been found to be necessary.

Then follows a week at least of thorough shampooing of the head every morning with ether soap if it can be tolerated, followed by the rubbing in of the oil mixture described above. This is persisted in until all the scales and scurf have separated and the scalp is left in a clean and healthy condition.

This latter part of the treatment can be carried out, as a rule, in the patient's home, with occasional inspections to insure that it is being properly done; but, in view of the fact that painful reaction may occur as the result of the application of the lotion, it

would seem advisable that this should always be carried out by a medical man.

Very few cases require more than one course of treatment in this way, provided that it is carefully and thoroughly carried out in the first instance; the average number of days needed to effect a cure has been about that noted by the originator of the treatment, *i. e.*, just over a fortnight.

The essential points for success appear to be:

1. Very close cutting, or shaving, of the hair all over the head.

2. General treatment of the whole scalp, even though only a small part of it appears to be infected.

3. Maintenance of continued cleanliness and the application of an oil dressing to facilitate the separation of scurf and scales.

4. Inspection of the whole of the affected family and their treatment, if necessary, to insure that there is no risk from such sources of the patient becoming reinfected.

5. Disinfection of articles of clothing and bedding which may carry or retain the spores of the disease both during and at the end of the treatment.

The Radiological Treatment of Diseased Tonsils.

HUNTER, in the *Virginia Medical Monthly* for April, 1924, states that the technique employed varies somewhat with the individual operator. Thus Witherbee and his associates began their work with an 8-inch spark-gap, 5 milliamperes of current, a 10-inch distance between the target and highest portion of skin, a filter of 3 mm. of aluminum, and sittings varying from three to seven minutes. In his later work Witherbee uses a 7-inch spark-gap with an exposure of three minutes and eighteen seconds, the other factors remaining the same, treatments being given every two weeks. Waters and his associates, on the other hand, use a technique employing a 7-inch spark-gap, 5 milliamperes of current, a 10-inch target-skin distance, filtered through 4.5 mm. of glass and half an inch of orthopedic felt. Two exposures are given every week for four treatments, or one series; and another series three or four weeks later. Simpson, who has done all his work with radium, advises the use of the double-strength plaque, or 30 milligrammes of radium, applied directly to the tonsil for one hour. In a personal communication he writes: "We have any number of tonsil cases and are using my plaque in some few, while in others we are inserting the emanation seeds. We find that the latter give more of a reaction here than does the radium plaque."

Following the original techinque of Witherbee and his coworkers, the Roentgen rays are applied by Hunter directly over both sides of the neck just below the angle of the jaw, care being taken to protect the parotid gland. He uses a spark-gap of 8 inches, 5 m. a. of current, a target-skin distance of 10 inches, a filter of 4 mm. of aluminum, a layer of chamois skin, and a time of four minutes. These treatments are repeated every two weeks for about eight times. In the meanwhile radium is applied directly to the tonsil. Following the technique suggested by Cameron, he uses a special applicator of brass, in which 50 milligrammes of radium are placed, this in turn being covered with rubber. These treatments last from one to two hours. No appreciable reaction has occurred. In his cases no second application has been found necessary. It will thus be seen that only the gamma rays are employed, and as the radium is applied inwardly and the Roentgen rays externally, a very desirable system of cross-fire irradiation has been obtained. Of the two modalities, if only one could be used, he prefers the Roentgen ray, as its application is attended by no discomfort and the glands of the neck are irradiated at the same time as the tonsils.

It will be seen that the treatment as outlined and employed by the various workers is devoid of danger. In the cases treated by Witherbee and himself there has been no reaction. This is as it should be, for the amount of irradiation employed at any one time is less than one-third of any erythema

dose. Water's technique is somewhat more extended, yet he reports that he has observed nothing more than a mild erythema. Nor does the amount of radium irradiation give rise to unpleasant symptoms; the only discomfort is at the time of the application. If we adopt the rule that 100 milligramme hours of the beta rays of radium are sufficient to obtain a mild erythema or 600 milligramme hours of gamma irradiation, it will be observed that no reaction is to be expected. Personally, he has applied 50 mgs. of radium as screened above to the throat for a total of twelve hours in three days for a carcinoma, with a promising result and no untoward symptoms.

Hunter concludes that we have in the Roentgen rays and radium a highly effective method for the treatment of diseased tonsils. A marked improvement and a clinical cure should be obtained in almost every case. The patient will suffer no loss of time or other inconvenience. Even in those cases in which no result has been obtained, no harm has been done and surgical intervention can still be considered.

Surgical and Genito-Urinary Therapeutics

Intracranial Pain.

BARNHILL (*Surgery, Gynecology and Obstetrics*, February, 1924) believes that pain anywhere probably is always caused by absorption of toxic products by sensory nerves, or by their traumatism. Usually both these causes are active at the same time. This pain may be due to pressure, to infection, or to pressure plus infection.

The dura mater, because of its position next the skull, is the part most easily traumatized by intracranial pressure. It is also the only intracranial tissue that is to any degree endowed with sensation. The brain itself is wholly without sensation. The pia mater has but few sensory nerves, while the arachnoid is wholly insensitive. In the dura mater, therefore, all intracranial pain originates. The actual cause of the pain often lies in the deeper structures of the brain, but the influence of that cause must in some way reach the dura mater before pain may be produced.

One disease, tic-douloureux, which probably causes intracranial pain, although such pain is commonly recorded externally, is an affection of the Gasserian ganglion and has no definite pathology. Possibly tic-douloureux should not be classified as a disease giving rise to intracranial pain. It certainly has not been proven that tic is the result of infection. It is, however, becoming increasingly clear that the real pathology, whatever it may be, is oftenest in the ganglion, and that the external pain of tic is but a reflex.

A long list of acute and chronic general diseases are responsible for the intracranial pain incident to the circulation of toxic substances in the blood. Common headaches, often severe and recurrent, reducing health to the point of invalidism, are due to this cause. Toxins arising from indigestion or constipation circulate in the blood stream of the brain and poison, temporarily, the sensitive dural nerves. No doubt transitory exudates occur simultaneously, and thus both toxicity and pressure act together as a cause of pain. Migraine, worst of periodic headaches, should probably be placed in this class of ephemeral, toxic headaches. Meningitis, typhoid fever, measles, smallpox, and erysipelas head the list of acute diseases. All these may be heralded and accompanied by intolerable headache. The toxin is absorbed by the sensory dural nerves, and the increased blood supply plus the accompanying exudates traumatize the dura by crushing it against its osseous capsule. Among the chronic diseases of this class Bright's disease and glycosuria are best examples. A small tumor which obstructs the inter-

ventricular circulation may produce more pain than a tumor many times its size but placed differently. The amount of brain displacement and consequently the degree of intracranial pressure is more the cause of the pain than is the nature of the tumor itself.

Intracranial pain is undoubtedly less frequent than formerly. It has to no inconsiderable extent been prevented or conquered by modern medical and surgical science. The internist and laboratory expert, working together, have discovered the cause and nature of blood-stream infections acting on the brain to cause pain, and have in several pain-producing diseases, notably in syphilis and diabetes, robbed these diseases of their most terrorizing symptoms. Surgery also has added greatly to the relief of intracranial pain when due to tumor growths or fluid collections.

Steinach's Rejuvenation Operation.

WALKER and COOK *(Lancet,* Feb. 2, 1924) contribute a careful study of Steinach's work, a summary of clinical results and conclusions derived from laboratory study as applied to man. After briefly outlining Steinach's experimental results and conclusions, they state that it is difficult to offer any explanation of the remarkable results obtained in his animal experiments other than the explanation which he himself furnishes, namely, that ligature of the vas, by increasing the output of internal secretion, thereby stimulates the endocrine system generally and reawakens the waning energies of the senile animal. Whether, in addition to bringing about a condition of renewed activity, the operation of vasoligature has any effect in actually prolonging the duration of life is an entirely separate question, for, as Steinach himself has pointed out, the span of life of a single individual can never be predetermined, so that definite proof of prolongation must inevitably be lacking. It is noteworthy, however, that several of the animals ligatured by Steinach reached an unusually advanced age, one of them living three years, and thereby surviving a brother born in the same litter and dying of normal decay by seven months.

If we accept the testimony given by Steinach as to his experimental work we are almost bound to accept his theory, for no other explanation of his results is available. Fiebinger's suggestion that the rats used in these experiments were not suffering from old age, but from mange, and that the improvement in their coats and general condition was the result not of the ligature, but of the good feeding and attention they received in Steinach's laboratory, is scarcely sufficient to explain his results when we keep in mind the completeness and ingenuity of the tests to which the animals were subjected before and after operation.

Like Ancel and Bouin, Steinach found that ligature was followed by degeneration in the seminiferous tubules and increase in the interstitial cells. Accepting Ancel and Bouin's view that the latter cells are the sole source of the internal secretion of the testis, he naturally claimed that the histological changes found in the testis furnished additional proof that by his ligature he had stimulated the output of sex hormone. Granted the truth of Ancel and Bouin's theory, Steinach's line of argument was logical. If, however, we do not accept the dictum that the interstitial cells are the sole source of the internal secretion of the testis, we cannot accept an increase in the interstitial tissue as a proof that the output of sex hormone has been stimulated.

Nothing is more difficult than to assess the clinical results of ligature of the vas in man. This is due not only to the absence of definite measurable data by means of which improvement can be gauged, but also to the fact that it is almost impossible in the human subject to exclude the action of mental suggestion. Moreover, difficulty is generally experienced in selecting cases suitable for operation, since pure senility unassociated with such complications as bronchitis, cardiac lesions, etc., is of uncommon occurrence, and variations and improvements in the secondary lesions are likely to obscure and confuse the issue.

After citing papers as published by others and giving in sufficient detail case histories of those on whom they themselves operated by vasal ligation, the authors conclude as follows:

At the present time there is insufficient material on which to base a decision as to the value of vaso-ligature as a means of treatment in man. The results of the operation appear to have been capricious, although numerous cases are reported in which benefits accrued. As, however, the data on which the claims of improvement rest are inexact and incapable of measurement, a large number of observations will be necessary before it will be possible to bring in a final verdict as to the precise value of this form of treatment. However, whatever the verdict concerning this clinical problem may be, the results obtained by Steinach in his animal experiments are certainly of the greatest biological interest.

Hypertrophic Pyloric Stenosis.

Poynton, Higgins and Brydson *(Lancet,* Feb. 2, 1924) note as classical symptoms of pyloric stenosis projectile vomiting, visible peristalsis, tumor, and constipation. Active visible peristalsis is valuable, but the tumor is of the first importance.

It is most important to have the stomach as empty and as clean as possible at the time of operation. A distended stomach makes for operative difficulties, while the passage of stagnant stomach contents into the intestine, immediately the pyloric stricture is relieved, is most undesirable. A short course of gastric lavage is therefore an essential preliminary, especially in long-standing cases with very dirty stomach contents. The final wash-out is done one hour before operation.

Subcutaneous infusion of saline with glucose (2 per cent) to combat shock is administered usually twice, (1) twelve hours and (2) two hours before operation, 1½ ounces being run into each axilla. The baby's limbs are bandaged in cotton-wool, and the trunk warmly wrapped. The operating room is specially heated (75° F.).

The last feed is given four hours before the operation.

No preliminary hypodermic injection is used.

Ether and chloroform are contraindicated by the grave danger of acidosis in these starved infants. Gas and oxygen are used in all cases. Five of the worst cases in the total series were successfully operated upon under local infiltration alone.

The baby is laid on a well-protected hot-water bottle, so as to throw the epigastrium into prominence. The abdomen is opened above the umbilicus to the right of the middle line by incising the rectus sheath and reflecting the muscle outward. The stomach is picked up from beneath the liver edge and the pylorus delivered. Escape of intestine is prevented by a narrow "pack" tucked into the lower angle of the wound, and as little of the stomach as is necessary is brought out of the abdominal cavity. The operator fixes the pylorus with his left thumb and forefinger, while the assistant gently grasps the stomach; the "avascular" line on the anterior surface of the pylorus, close to its upper border, is identified. Occasionally this line may be invaded by a little vessel. With a clean scalpel the incision in the pylorus is begun, dividing the peritoneum and just entering the muscle layer. The muscle section is completed by using a pair of closed scissors as a blunt knife. These instruments divide the muscle quite easily and cleanly, and cannot injure the mucous membrane, as the latter bulges into the gap. The section must, of course, completely divide the pylorus, and special attention is always given to both ends of the incision with the object of insuring this. Having completed the section, the cut edges of the sphincter are undermined, and the gap widened so as to insure that the mucous membrane will bulge and herniate well up into the gap.

The pylorus is now carefully inspected for any bleeding point. Occasionally a

small vessel may ooze in the subperitoneal or in the submucous coat. Usually a pinch with forceps suffices to stop this. If necessary it may be underrun with a fine needle and catgut, or a muscle graft taken from the rectus abdominis may be applied.

The total number of cases reported is twenty. Sixteen were cured and four died. The authors conclude that in the present state of our knowledge (or ignorance) of the pathology of pyloric stenosis, operation offers the most speedy and certain cure of the disease.

The authors conclude that the operation of choice is Rammstedt's.

That the best results are obtained when the operation is performed at the earliest possible moment after the onset of the symptoms.

That the only absolute diagnostic sign is the feeling of the pyloric tumor; without this sign having been elicited operation is only justified in rare instances.

That in a breast-fed infant, where symptoms and signs develop suggestive of pyloric stenosis, the infant should not be weaned until a definite or negative diagnosis can be made, because experience has shown that feeding with breast milk is of great assistance to recovery.

Treatment of Brain Injuries.

Bearing on this subject CORBETT *(The Journal-Lancet,* Feb. 1, 1924) quotes Cannon to the effect that edema of the brain is due to changes in osmotic pressure in the tissue of this organ, caused by contusion.

Increased volume of the brain occurring in the condition known as edema is not alone on account of the brain taking up water, but there must be some physical change in the brain substance. We cannot demonstrate this microscopically, but can express the change as of a colloid or colloid-chemical nature. This same phenomenon has its analogue in a very homely experiment. Let one fill a bottle with beans and then fill all the interstices with water, cork the bottle, and allow it to stand. Sufficient pressure will develop to burst the bottle, and the beans will be so expanded that their surfaces will be covered with facets.

It has been said that the function of the cerebrospinal fluid is to provide a mechanical safeguard to the centers and a regulatory mechanism for the blood supply to the brain. In edema of the brain it is apparent that the veins concerned in absorption are blocked; therefore relief from pressure by absorption of fluid does not normally occur. If we can then, in any way, remove a small part of the fluid we relieve the pressure and in some degree unlock the portal of absorption so that the balance may be restored. There seem to be two methods at our hand to accomplish this:

Intravenous injection of hypertonic salt solution.

Spinal puncture.

In regard to intravenous injection: The research by Foley shows that when concentrated salt solution is injected into the veins there occurs a complete reversal of the normal circulation of cerebrospinal fluid. Under this procedure the choroid plexus no longer secretes, but actually absorbs cerebrospinal fluid; the arachnoid villi, whose normal function is to absorb, then secrete; and the whole current of the fluid is reversed. This will decrease the fluid in the ventricles and to some degree take water from the brain. Theoretically this seems beautiful, but the results in actual clinical cases have not been very good in that a secondary reaction has always followed with increased edema.

Coma may exist as a result of the brain trauma without increased intraspinal tension, but the usual subsequent occurrence of edema is apt to complicate the condition by further increasing intracranial tension. Edema has never been very evident before eight hours after the accident; therefore early spinal puncture is not advisable unless there is special reason for it.

The pulse-rate does not seem to give any index of the manometer reading, especially late in brain injury, when it is probable that spinal puncture does not register intracranial pressure on account of partial

plugging of the foramen magnum. In cases showing increase of mental torpor and in all cases of coma, spinal puncture is indicated at a time from eight to seventy-two hours after the accident. When there is respiratory embarrassment or marked slowing of the pulse, spinal puncture is indicated. However, this may actually intensify slowing of the pulse when done late in the condition owing to lack of free communication between the structures above and below the foramen magnum.

Moody reports that of 908 autopsies there were 100 cases of extradural hemorrhage of such size that compression of the brain by blood was the cause of death. Of these the diagnosis was made by autopsy in 63 cases. In fatal cases the blood weighed from 40 to 46 gm. He further calls attention to the occurrence of leucocytosis in these cases. From these reports one might reason that extradural hemorrhage was common and that its recognition during life was difficult. There is nothing more dramatic than the course of a case of extradural hemorrhage. The patient may have a momentary or a prolonged period of unconsciousness followed by a greater or less lucid interval. Then in the course of from six to twelve hours there is a gradual progressive development of a new train of symptoms. For example, a patient may walk into a doctor's office and report that he has been struck on the head. If he is kept under observation symptoms of localized compression develop. Extradural hemorrhage is most common from rupture or tearing of the middle meningeal artery; therefore the motor area is affected early. While the patient is still conscious certain motor phenomena develop. First of all, slight increase in reflexes, then fibrillar twitching of muscles, then as consciousness begins to drift away there develop in the muscles of the leg and arm first a flaccid paralysis and loss of reflexes, and later this may become spastic. Immediately before the development of coma aphasia can often be demonstrated if hemorrhage is on the left.

Examination of the eyes shows a rapidly developing papilloedema. The pupil is often dilated on the same side as the hemorrhage. Finally complete unconsciousness develops. The pulse becomes slow, respiration stertorous, and the pulse pressure becomes raised. Sometimes the pulse pressure is twice the pulse rate. Such a case can get relief only through surgical intervention. Death will ensue from anemia after the intracranial pressure exceeds the blood-pressure.

The surgical indication is to operate as soon as diagnosis is made. This necessitates ligation of the middle meningeal or packing a sinus with gauze. The recovery in its completeness depends on the amount of damage done to the brain cells by pressure.

Intracranial Hemorrhage in the Newborn.

SHARPE and MACLAIRE *(Surgery, Gynecology and Obstetrics,* February, 1924), conclude an excellent paper on this subject as follows:

1. Intracranial hemorrhage of the newborn occurs more often than was formerly suspected.

2. Death results from extensive intracranial hemorrhage and cerebral edema unless the hemorrhage can be entirely absorbed by the natural means of excretion without any resultant organization residue; the unrecognized and therefore improperly treated cases of the milder degree of intracranial hemorrhage develop in a large percentage later some form of cerebral spastic paralysis with or without mental impairment.

3. Cerebral spastic paralysis due to intracranial hemorrhage should be differentiated from Little's disease, the latter including only those cases due to cerebral agenesis and meningoencephalitis.

4. Pediatricians, neurologists, and neurosurgeons usually see the cases late as chronic conditions when spastic paralysis in its various forms has already developed, and when the condition at best can only be improved, whereas it is the obstetrician who sees these cases in the acute stage.

5. The acute cases with mild signs or no recognized signs at all are overlooked.

6. A study was undertaken to detect apparently signless intracranial hemorrhage in the new-born, with the result that 13 per cent of 100 consecutive deliveries at the City Hospital were discovered as having an intracranial hemorrhage of varying degree by routine lumbar puncture within the first twenty-four to forty-eight hours after birth.

7. Low forceps and syphilis were not found to be important factors in the causation of intracranial hemorrhage at birth.

8. Lessened coagulability of the blood does not appear to be an important and frequent factor in intracranial hemorrhage of the new-born, the clotting time not being lengthened in any of the cases in this series within forty-eight hours after birth.

9. Lumbar puncture as a diagnostic and therapeutic measure has proven to be a safe procedure in this series, in the absence of shock.

10. Apparent signs indicative of an acute intracranial hemorrhage and cerebral edema can be confirmed or disproven by early lumbar puncture and the resulting intracranial pressure as estimated by the spinal mercurial manometer, and in doubtful cases the appropriate treatment may be instituted early.

11. Lumbar puncture is advocated as a safe routine procedure in suspected cases having the mildest signs of intracranial hemorrhage and cerebral edema within seventy-two hours after birth, and is a valuable aid to the natural means of their absorption.

12. Repeated spinal drainage by means of lumbar puncture at intervals of six to twenty-four hours is advocated in cases of bloody spinal fluid under varying degrees of pressure.

13. If repeated lumbar drainage fails to diminish progressively the blood concentration and the pressure of the crebrospinal fluid, then a modified subtemporal decompression and cranial drainage is indicated.

14. The fact that an intracranial hemorrhage occurred in 9 per cent in the first series of 100 consecutive deliveries and in 13 per cent. in the second series of 100 would tend to indicate a more frequent intracranial lesion at the time of birth than ever conceived.

As for the symptoms of intracranial hemorrhage, Sharpe and Maclaire observe that the cases are brought to the neurologists or neurosurgeons late when the mothers notice that their children fail to sit up or walk, teething is delayed, mental impairment is present, paralysis is manifest, or some other obvious sign is present. A large hemorrhage will cause extreme stupor, cyanosis, repeated convulsions, spastic paralysis, opisthotonus, bulging anterior fontanel, and the separation of sutures. The slighter hemorrhages are for the most part overlooked and permitted to remain undiagnosed. They may be characterized by slight drowsiness, apathy, a few muscular twitches, failure to nurse properly, and feeble or irregular respirations. Even these symptoms, in the mildest cases, may be entirely wanting. Holt states that cerebral hemorrhages are found when there have been no signs referable to the brain. He is aware of the frequency of the condition and he belongs to the minority group.

Pain Associated With Surgical Lesions of the Eye.

Patton *(Surgery, Gynecology and Obstetrics,* February, 1924) notes that although the failure to recognize the significance of pain secondary to surgical lesions of the eye may only in very rare cases result in the death of the patient, there are numerous cases in which the pain is so severe and far removed from the involved eye and the general symptoms so prostrating that the vision of one or both eyes may be irrecoverably lost before either the surgeon or patient awakes to the fact that the eye is the source of the trouble.

This is especially true in acute inflammatory glaucoma. In the majority of cases the diagnosis is easy enough. The patient is well aware that the eye is exquisitely tender and that the severe neuralgic headache is directly associated with the ocular

condition, but every oculist of experience has seen cases in which the attack is ushered in by a most severe prostrating neuralgic sick-headache. Nausea and vomiting may be a prominent symptom with or without severe epigastric pain. The patient is glad to lie perfectly quiet with the eyes closed, not even suspecting that they are the source of the trouble. Any case of otherwise unexplained neuralgic headache with or without gastric symptoms should suggest the possibility of an acute glaucoma.

Pain of a similar character, though less severe, associated with a blind eye, especially of long standing, may indicate the presence of an intraocular tumor, and if the oculist cannot definitely rule it out the general surgeon first suspecting the condition should lend his moral support on the side of enucleation. A sudden pain in or about the eye during the course of pneumonia, typhoid fever, etc., should at once suggest the possibility of a beginning metastatic panophthalmitis. Here again the symptoms may be masked, and as the progress is often very rapid an early grave prognosis is indicated.

A beginning iritis or iridocyclitis may be mistaken for a simple conjunctivitis, and much valuable time and even useful vision lost unless the surgeon remembers that the headache of which the patient complains, radiating over the side of the head and worse in the after part of the night, is most suggestive of iritis. If on palpation he finds a zone of tenderness just back of the cornea he can feel sure that the ciliary body is also involved. Pain on rotating the eyeballs usually means an inflammation of Tenon's capsule and indicates a prompt search for some focus of infection. A retrobulbar inflammation of the optic nerve may be painless, but a rapid decrease of sight associated with deep pain back of the eye should suggest this condition or possibly a deeply seated orbital tumor, although this condition can usually be recognized by the displacement of the orbital contents. The pain of an orbital abscess is more severe than either of the above but of the same character, usually associated with more or less general prostration. Corneal infections may cause pain out of proportion to the appearance of the lesion. Here again the pain is radiating in character, but there is usually sufficient local discomfort to call attention to the area involved.

The headaches and eye-aches resulting from errors of refraction and muscle unbalance are as a rule easily recognized from the history, although they may be so severe at times as to be quite incapacitating and demand prompt recognition and relief. Two forms of pain from this source may be misleading, viz., deep cramping aches at the back of the neck and between the shoulder-blades, the result of faulty posture, and the severe often one-sided headaches associated with so-called scintillating scotoma, both calling for careful attention to refraction and muscles.

In conclusion, we should remember that a severe neuralgic headache with or without nausea should suggest the possibility of acute glaucoma; that the pain of iritis is worse in the second half of the night; that sudden pain in one eye during the course of a general septic process may mean a destructive panophthalmitis; that pain in or about an old blind eye is an intraocular sarcoma unless proved otherwise; and that even though the pains indicating the lesser lesions mentioned may not indicate such grave conditions that are worthy of recognition by the general surgeon, his prompt intelligent advice will entitle him to the heartfelt gratitude of his patient.

Radium Therapy.

There is an excellent abstract in the *Lancet* of February 23, 1924, of the annual report of the Radium Institute of London for the year ending December 3, 1923. It is premised by a statement to the effect that the services of the surgeon are being requisitioned more frequently for the purpose of employing radium in the most effective manner, and recently reported advances in that direction comprise the treatment of laryngeal growths by subhyoid pharyngotomy; and of inoperable cancer of the

uterus with extensive infiltration of the broad ligaments, by performing a medium laparotomy and burying the radium tubes in the diseased tissues from the peritoneal surface. Cases of carcinoma of the cardiac end of the esophagus have also been treated by the introduction of radium tubes through a gastrotomy opening.

The combination of diathermy with radium has, during the past twelve months, yielded some highly successful results in the treatment of carcinoma of the tongue, mouth, tonsils, and fauces, many cases of very advanced type being greatly benefited, the suffering much relieved, and the progress of the disease retarded or arrested. The customary procedure consists of the removal or destruction of the primary focus of the disease by diathermy, excision of the more easily accessible associated lymphatic glands, and a subsequent general radiation of the whole operation area with radium tubes and applicators.

The general trend of radium therapy is in the direction of increase of dose, more especially at the first exposure, and the employment of quantities of radium element varying from 250 to 750 mg., with screening of 2 mm. of lead, and exposure of from twenty to thirty hours' duration, is now by no means unusual in the treatment of such conditions as an extensive mammary cancer, mediastinal growths, lymphosarcoma, lymphadenoma, and lymphatic leukemia.

1. It is not, however, wise to use such a heavy dose when the radiation is directed chiefly to the abdominal cavity, as recent experimental researches have shown that the mucus-forming cells of the intestines are peculiarly susceptible to gamma rays.

The term radon is suggested to replace that of radium emanation. The therapeutic value of radon is becoming widely known and appreciated.

2. "Advice is freely given to medical practitioners in the treatment of disease with radon apparatus, and if precise information is furnished as to the nature and extent of the disease or growth, a suitable apparatus, correctly screened, with full instructions as to technique and exposure, can usually be forwarded to any address in the British Isles within two or three days."

It is true that radon slowly decays, its initial radioactivity being reduced to one-half in 3.85 days, and to one-fifth in 8.8 days; but this rate of decay never varies, and it is thus a perfectly simple matter to prepare an apparatus the mean activity of which during a period of twenty-four hours would be exactly equivalent to that of a radium salt apparatus of a stated strength. Radon, moreover, has one particular advantage over radium salts: being a gas it is highly compressible, and a curie of radon (the amount of radon in equilibrium with a gramme of radium element) can be contained in a space of only 0.58 c.mm. This property permits of the manufacture of extremely small radon tubes or applicators, possessing a very intense radon activity. Further, radon possesses no intrinsic value, and should a radon applicator be mislaid or destroyed, the only pecuniary loss incurred is the value of the metal container.

The normal thyroid gland is but little affected by radium rays, and radium therapy is of doubtful value in the treatment of simple goitres and should never be regarded seriously as an alternative to surgery. In the soft parenchymatous type, however, it may be used with a certain amount of justification, if operative measures have been negatived for any reason.

In advanced and inoperable cases of malignant goitre radium treatment should most certainly be adopted. It will often arrest the progress of the disease in a most striking fashion, causing a great reduction in the size of the growth and affording much relief to the symptoms.

When the existence of an enlarged thymus gland is suspected a definite diagnosis should be made and treatment carried out by a "cross-fire" radiation of the area with flat applicators containing 50 to 100 mg. radium element screened with 2 mm. of lead. The total exposure should be of fifteen to twenty hours' duration, preferably

given in three or four equal periods on successive days. The gland rapidly shrinks, and a second series of exposures is rarely, if ever, necessary.

Chronic enlargement of the spleen from congestion is met with in hepatic cirrhosis and in chronic cardiac and pulmonary affections. It also occurs in certain constitutional conditions—syphilis, rickets, malaria, and lardaceous disease—but in none of these affections is radium therapy of any practical value. There are, however, three diseases in all of which there is great enlargement of the spleen, and in which radium treatment is indicated, as it rapidly induces a considerable shrinking in the size of the organ with an associated improvement in the patient's general condition.

These three diseases are simple splenomegaly, splenic anemia, and splenomedullary leukemia.

The action of radium rays in the treatment of tuberculous adenitis is probably of a twofold character. Numerous experiments have been made with regard to the action of radium rays on tubercle bacilli, and it has been found that exposures of at least 100 hours' duration with full-strength applicators unscreened are necessary to produce a lethal effect. Such exposures are outside the range of practical therapy, and for this reason radium irradiation cannot be used for the distinct purpose of killing tubercle bacilli. It has, however, been noted that cultures of tubercle bacilli which have received a relatively short irradiation have their vitality greatly inhibited, and that subcultures made from them grow much more slowly than controls and exhibit numerous involution forms. It is probable, therefore, that the radiation of tuberculous glands weakens the vitality of the contained tubercle bacilli and enables their destruction to be more readily accomplished by the phagocytic cells. Further, the radium irradiation acts as a stimulus to the production of fibroblasts with the consequent development of an encircling, constricting, and protective fibrosis.

Lymphadenoma usually exhibits an exceedingly favorable response to radium therapy, more especially when the superficial glands only are affected and no enlargement of the spleen, liver, or mesenteric glands is appreciable.

It is in the treatment of lymphosarcomata that the most spectacular results of radium therapy are to be seen. The lymphosarcoma cell is peculiarly susceptible to gamma radiation and its degeneration rapidly occurs. The rapid degeneration and absorption of the lymphosarcomatous cells, however, necessarily produces an autotoxemia, and the systemic disturbance is generally considerable, sickness, lassitude, headache and a rise of temperature being pronounced features.

Radium treatment is very effective in improving the condition of the blood in lymphatic leukemia. The lymphocyte is probably, almost certainly, the most susceptible of all cells to radium, and for this reason radiation of the enlarged glands is speedily followed by a definite decrease in the total number and percentage proportion of the lymphocytes. With this fall there is usually associated an improvement in the general symptoms, and the patient's health is decidedly benefited. It is, however, extremely difficult to predict how long the improvement will last. In a few cases the disease will remain quiescent for a year or eighteen months, but as a general rule indications of a relapse appear in between four and six months, and a repetition of the treatment becomes imperative. The ultimate prognosis is bad, but the adoption of radium treatment usually effects a considerable prolongation of the patient's life.

The treatment of secondary malignant growths of the lymphatic glands is mainly surgical, most operations for the treatment of malignant disease being planned on a scale which provides for a wide removal of the associated lymphatics. In many cases, however, radium treatment is employed as an adjunct to surgery, a prolonged screened radiation being given over a wide surrounding area, with the twofold object of bringing about the degeneration

of any scattered or isolated foci of the disease, and of arresting the permeation of malignant cells through the lymphatics. When the removal by dissection of malignant glands is impossible or inadvisable, radium treatment may be adopted, as it will often cause a considerable diminution in their size and arrest the spread of the infection to neighboring glands. When the masses are superficial, and in easily accessible situations, treatment with buried radium tubes, screened with 1.0 mm. of silver or 0.3 mm. of platinum, is to be advocated. When deeply situated or attached to important structures, blood-vessels, or nerves, the prolonged screened radiation from "full-strength" applicators is to be preferred.

The Scope and Limitations of Subtemporal Decompression in Acute Brain Injuries.

LYERLY *(Virginia Medical Monthly*, February, 1924) contributes a paper based on an experience of 96 cases of acute head injuries with unconsciousness, or signs of intracranial injury, admitted to the hospital division of the Medical College of Virginia over a period of one year from July 1, 1922, to July 1, 1923.

Of these cases there were thirteen deaths, making a mortality of 13.5 per cent. This includes all of the fatal cases, some of which died within a few hours after admission.

There were forty-one cases of fracture of the skull, thirty-two of which were compound, eight depressed; five of the latter were compound as well as depressed. All of the cases of depressed fractures were operated upon to remove the depressed fragments. This does not mean that they had a subtemporal decompression, which is done to relieve general intracranial pressure. It may become necessary later to do a subtemporal decompression in these cases if the intracranial pressure becomes excessive.

Of the thirteen cases that died, eleven had fractures, and two showed no fracture of the skull. In these two cases that showed no fracture, one was proved by autopsy, and in the other no autopsy could be obtained. The absence of fracture in this case was proven by the *x*-ray; an extensive laceration of the scalp allowed of direct inspection; the spinal fluid was very bloody and increased pressure was shown by spinal puncture. This indicates that it is not necessary for a patient to have a fracture of the skull in order to receive a fatal intracranial injury.

As to the cause of these injuries, thirty-three were caused by automobiles, twenty-eight by falls.

There were forty-six cases with lacerations of the scalp. Regardless of whether or not the patient has a fracture underneath the laceration, these lacerations should be excised under local anesthesia within the first twelve or sixteen hours, or as soon after shock as possible, in order to convert a potentially infected wound into a clean incised wound. For compound depressed fractures or gunshot wounds of the brain, the treatment should be débridement of the scalp and removal of contaminated bone, with irrigation of the wound in the brain with normal saline solution to free it of blood clots and other foreign material.

In this series there were nine subtemporal decompressions with four deaths. Two of the deaths were due to meningitis as proved by autopsy, the source of the infection in one case apparently coming from a fracture into the sphenoid sinus, and in the other from a fracture through the middle ear with rupture of the ear drum on the same side. The third and fourth deaths occurred in patients who developed pneumonia, as proved by autopsy in one case, and clinically in the other.

Intracranial pressure is undoubtedly the most important effect of the average brain injury.

The most logical way of classifying these cases from the therapeutic standpoint would be: Those which do not have intracranial pressure, and those which do have intracranial pressure. Under the class of cases which do have intracranial pressure it may be due to: (*a*) edema of the brain; (*b*)

hemorrhage; (*c*) edema plus hemorrhage; (*d*) meningeal hemorrhage; (*e*) infections, meaning meningitis, encephalitis, or abscess; and (*f*) localized pressure as in depressed fractures.

When a patient is admitted to the hospital in an unconscious condition, or with a history of transient unconsciousness, every effort should be made to determine whether or not he has a dangerous pressure. The signs upon which we rely chiefly to determine this are: drowsiness or unconsciousness, pulse rate, systolic and diastolic blood-pressure, eye-ground findings, and spinal fluid pressure measured with a manometer at spinal puncture; and of less importance signs such as vomiting, condition of pupils, *x*-ray examinations, focal signs, temperature, convulsions, and respiration. If there is a rapid increase in the intracranial pressure, as from hemorrhage, during the first three to twelve hours, there will be first a slowing of the pulse rate and a rise in the systolic and pulse blood-pressures. Later, if the pressure is not relieved, a rise in the pulse rate and a fall in the systolic with a high pulse pressure will result from a fatal pressure transmitted to the medulla. If the life of the patient is to be saved, before the pulse rate begins to rise or the systolic blood-pressure drops, quick and efficient measures will have to be instituted to relieve the pressure, employing a subtemporal exposure to evacuate the clot and stop the bleeding, as in meningeal hemorrhage. It would be useless to temporize with a spinal puncture to relieve the pressure in such a case. Should the pressure come on more slowly over a period of days, as from cerebral edema, we have not found any great rise in the systolic blood-pressure, but there does seem to occur a rise in the pulse pressure and a slowing of the pulse rate. Here haste in radical measures to relieve the intracranial pressure may not be necessary, and resort to more moderate procedures is advisable. There may be given a thirty-percent solution of sodium chloride in one- to two-ounce doses every three hours, or a saturated solution of magnesium sulphate given in half-ounce quantities every three hours, as advised by Dowman, with daily spinal punctures to estimate the spinal fluid pressure with the manometer and to reduce the pressure by withdrawal of the fluid as advised by Jackson and others.

There is probably no other condition which the surgeon must recognize and meet more promptly than a case of extradural hemorrhage. The history of a relatively mild head injury, with or without temporary unconsciousness, followed by the so-called "lucid interval" of consciousness, and then followed by unconsciousness, should always put us on our guard against extradural hemorrhage. The condition must be recognized early, relying on the patient's history and condition before he becomes unconscious, also the unequal pupils, the slow pulse, and the high systolic and pulse pressure. When it is recognized, a prompt operation must be done through the subtemporal route, with removal of the blood clot and ligation of the bleeding vessel, even before the systolic blood-pressure falls or the pulse rate increases, if the life of the patient is to be saved.

Deafness and its Prevention.

Under this title PATTON *(New Orleans Medical and Surgical Journal,* February, 1924) notes that acquired deafness may be divided into two great classes, conduction deafness and perception deafness, and possibly a third, otosclerosis. Conduction deafness is much the most common, although many believe the perception apparatus is always involved. What do we mean by conduction deafness? The ear is divided into external ear, drum membrane, middle ear and ossicles, internal ear with the cochlear part of eighth nerve, the eighth nerve and brain center. The outer ear, external canal, drum membrane, ossicles, and middle ear simply receive the sound and transmit it to the internal ear and auditory nerve, therefore the structures are known as the conduction apparatus, and deafness due to trouble in these parts is known as conduction deafness. Deafness due to injury or disease of the cochlear nerve, internal ear,

eighth nerve or brain is called perception deafness.

Congenital deafness takes place before the child is born, and may be due to a true congenital defect because of an abnormal development, or to syphilis of one or both parents. Hereditary deafness can be claimed only in those cases in which there is a deafness among the ancestors in the direct line. Acquired deafness comes on after birth within the first few months or later on in life, the result of some febrile disturbance, one of the exanthemata, or because of certain localized conditions, which interfere with the delicate mechanism of the middle ear. The majority of cases are the result of neglect of the ears during or after measles, scarlet fever, and meningitis. The meningitis may be either of the epidemic type or one of the low-grade meningitides so often caused by syphilis. Deafness caused by meningitis is usually of the perception apparatus. It is a sad commentary on our knowledge of the subject that over 30 per cent of the inmates of our institutions for the deaf are children who have an acquired deafness which might have been prevented if taken in time.

The removal of the tonsils and adenoids is a question of vital importance, particularly in relation to the subject with which we are dealing; there may be innumerable controversies as to whether the adenoids and tonsils should be removed, or when, for the purpose of improving health; there should be no question about their removal when any signs of ear trouble occur. The large adenoids give sufficient trouble to call for their removal. As to the small adenoids which often block and infect the mouth of the Eustachian tube, that is open to question in the minds of those who have not seen the aftermath, in the form of progressive deafness. No matter how small the adenoids are, no matter at what age they are first noted, be it the first months of life or during the second and third year, they should be removed, as soon as there is any evidence that they are causing trouble, particularly with the ears.

As a general rule, the majority of men are in favor of leaving the tonsils *in situ* until the second year of the child's life, unless they are found to be directly responsible for systemic disease, or have been the seat of repeated local infection; however, we must not lose sight of the fact that tonsils may cause impairment of hearing because of their close proximity to the Eustachian tube.

Medical men are realizing more and more that they must acquaint themselves with the various factors that lead to deafness in childhood, and with those factors which arrive in childhood and bring about deafness in later life, the problem divides itself into three parts: Education of the parents, teachers and physicians to those factors which give rise to deafness. The proper interpretation of the causative factor in early childhood which can be corrected at that time. Preventive measures which will arise during the routine examination of children's ears.

The general public, also the general practitioner, should know that a discharging ear is not only a source of danger to life, but will probably injure hearing. Don't send these cases away with the suggestion to wash out the ear with salt solution, or simply tell them "as long as the ears are discharging the poison is coming out, not to try and stop the discharge;" this is frequent advice. Even after the ear has ceased to discharge, children tested will be found to be slightly deaf. It is neglect in these early suppurating ears or in the adhesive or so-called catarrhal conditions that lead to deafness in later life.

Of all the cranial nerves none is so vulnerable to syphilitic infections as the eighth, or auditory; for this reason it frequently happens that the eighth nerve is first to feel its influence, and the otologist is thereby afforded an opportunity to recognize the general character of the disease from the start. In the majority of cases the cochlear branch is affected to a far greater degree than the vestibular; both may be affected simultaneously. In the marked shortening

of bone conduction we have one of the most reliable and most striking evidences of luetic infection, as it is perhaps the most striking sign, occurring in 95 per cent of cases. A deafness without apparent middle-ear trouble, showing a positive Rinne, should at once arrest the attention of the aurist. These cases if treated early by salvarsan, potassium iodide and mercury show marked improvement in hearing, at times complete restoration. Prognosis of the hereditary type is bad.

Femoral Hernia.

SOUTTAR *(British Medical Journal,* March 1, 1924) illustrates by his series of plates certain views he holds in regard to femoral hernia.

One of the most characteristic features of a femoral hernia is its appearance, a small spherical swelling lying below the fold of the groin. This swelling is not due to the hernia itself or its contents, and still remains when the hernia has been completely reduced. It is produced by a pad of fat, encapsuled by the tissues through which it has protruded, and arising from the mass of extraperitoneal fat which normally occupies the crural canal. This irreducible spherical mass of fat is at least very generally present, and it has given rise to the totally erroneous impression that the contents of a femoral sac are often irreducible. Beneath the skin of the groin this mobile ball of fatty tissue, tethered above in the crural ring, can be readily felt, and it is so characteristic of the condition that an immediate diagnosis of femoral hernia will rarely be at fault. The sac may only occupy a very small portion of its root, and the common existence of this fatty mass at the head of a hernia suggests that its traction on the peritoneum above it may have been the primary cause of the hernia itself.

This fatty tumor is of very definite value in the diagnosis between an inguinal and a femoral hernia. In any ordinary case the contrast is sufficiently striking between this soft, spherical, mobile swelling below Poupart's ligament, and the oblique elongated tumor above the ligament formed by an inguinal hernia. Absolute certainty can, however, be reached if the finger can be introduced into the external abdominal ring and finds it empty, whilst the swelling below persists.

A classical point in the diagnosis between an inguinal and a femoral hernia depends on the relation of the swelling to the pubic spine. In the former case the swelling is said to lie internal, in the latter external, to this point. This statement does not, however, rest on a very secure basis of anatomical fact, for an examination of any normal male will show that the spermatic cord either crosses the pubic spine or lies external to it, crossing the inner extremity of Poupart's ligament, and this remains the natural position of an ordinary oblique inguinal hernia. It is, however, true that the pubic spine is most readily palpated from the outer side of an inguinal hernia, by displacing the latter inward and upward, and from the inner side of a femoral hernia. The relation of the swelling to Poupart's ligament is of more direct value, in those cases where it can be readily felt. Even in a stout person the position of the ligament may be ascertained with sufficient accuracy by locating the pubic spine, since the position of the latter can always be exactly determined by following up the tendon of the adductor longus to its origin just below it.

A vertical incision over the swelling at once exposes the spherical mass of fat, when by a sweep of the fingers it can be cleanly isolated from the surrounding tissues. If the mass of fat is at all well developed it is a mistake to attempt to discover the sac directly within it. A better plan is to draw it downward, when the neck of the sac, almost free from fat, will be seen emerging from the crural ring. On drawing down the neck the yellow globules of extraperitoneal fat appear, showing that the normal peritoneum has been reached.

It will be found that at the neck of the

sac, just where it lay in the crural ring, there is a well-defined thickening. In early cases this involves the outer coats only, and these can actually be divided without opening the peritoneal coat and the sac itself. In old cases all the coats will be fused together and a narrow band of almost cartilaginous hardness may be formed, producing a close and sharp constriction in the neck of the sac; and this thickened neck is invariably smaller than the crural ring in which it lies.

It is clear, then, that Gimbernat's ligament and the other structures of the crural ring can play no direct part in the strangulation of a femoral hernia. Apart from the observations made above one would have thought that this was sufficiently obvious, since the femoral vein forms the outer boundary of the ring and must necessarily be compressed by any structure wedged tightly in the ring, with edema of the leg as an inevitable result; and this does not occur. Gimbernat's ligament does, however, play an indirect part of great importance. The constant friction of this sharp and rigid structure on the neck of the sac is the immediate cause of the thickening of the neck, first in the outer coats and then in the whole structure. On the inner side of the neck this is most marked, and it is just here that the pressure on a loop of intestine may be the most acute and the most rapidly destructive.

The practical importance of these observations can scarcely be overestimated. If the sac be drawn well down and the neck fully divided, a wide access to the abdominal cavity will be obtained, ample in most cases for the adequate examination of a loop of strangulated intestine. If further space is required, as for the resection of a gangrenous loop, it is readily obtained by dividing Poupart's ligament in the line of the incision. With such an exposure suture of the conjoined tendon to Cooper's ligament is easy, and the complete exclusion of the femoral canal which results furnishes the most substantial method yet devised for the closure of a large femoral orifice. It is only rarely, however, that such a procedure will be required. After a high division of the sac the opening can usually be closed quite satisfactorily by suturing Poupart's ligament to Cooper's.

Reviews

THE HUMAN TESTIS. By Max Thorek, M.D. Illustrated. J. B. Lippincott Company, Philadelphia and London, 1924.

To those who have followed current literature, indeed to those who have not, the comparatively recent work on restoration of youth by transplantation of the testes and ovaries is to some extent known. As is usual the method has been exploited by those least fitted to give it careful study, or to accurately report its results. It seems fairly well established that it is possible to make testicular implants which may furnish an internal secretion for a time at least, and in sufficient quantity to affect general metabolism.

Thorek has given most careful study to this question. His present book dealing with the anatomy, histology and pathology of the human testis, with particular reference to its endocrinology, has apparently for its main object the setting forth of the value of testicular implants, the indications for them, and the methods by which the desired results may best be attained.

Thorek has traversed the literature of the subject thoroughly. He dwells particularly on the so-called interstitial cells which, being first described by Leydig in 1850, are often called Leydig's cells. They are most abundant at birth and diminish as age progresses. The fat in these cells is a

phosphated lipoid, and crystalloids are usually found. They have a rich blood supply and are especially abundant in the connective tissue between the seminiferous tubules; they also occur among the tubuli recti and immediately beneath the tunica albuginea. Some beautiful microphotographs are given. It has been shown that the interstitial testicular tissue is a true gland of internal secretion, exercising the function of determining male sexual characters. Steinach's experiments and conclusions are quoted; there is an excellent chapter on the Pathology of the Testicles, one upon Dystrophies and Failure of Function, abundantly illustrated; one on Experimental Testicular Transplantations in Animals; one on the Influence of the *X*-ray in the Animal; and one on Homo-heterotransplants in Man. Blood affinity in animals and its importance in transplantation is considered. There is a chapter on Dementia Præcox and the Gonads, and a chapter on the author's experiments with Heterotransplants from Anthropoids to Man and Vice Versa. Thereafter follows a chapter on The Materials Used for Sex Gland Implantation; one upon Indications and Contraindications for Sex Transplantation to the Male; one on Technique, on the close observance of which the author attaches much importance. There is a discussion on the Interrelation of the Glands of Internal Secretion, and a chapter is devoted to the Therapeutic and Other Effects of Testicular Extracts.

This scholarly book, forcefully written, presents in a systematic way a subject which is at least worthy of serious consideration by the profession.

CIRCULATORY DISTURBANCES OF THE EXTREMITIES. By Leo Buerger, M.A., M.D. Illustrated. W. B. Saunders Company, Philadelphia and London, 1924.

This book, inscribed to Drs. William Mayo and Emanuel Libman, and designed to assemble, analyze and critically interpret the maze and multitude of facts bearing on circulatory disturbances of the extremities, admirably illustrated, exhibits an amazing degree of scholarship, of clinical acumen, and of laboratory research. To the casual reader it would make no large appeal; to the surgeon and physician who would understand more clearly the underlying causes and the nature of the affections with which he deals, and who could therefore apply more efficiently methods of arresting or curing pathological processes, this book will prove invaluable.

The author states, and truly, that "Even with a thorough knowledge of the distribution of the vessels, their gross and minute morphology, their rôle as dispensers of blood, their means of substituting by-paths through existing anastomoses, and even with a thorough acquaintance with the pumping mechanism, we are not thoroughly equipped for a comprehensive, critical and analytical approach to the subject. Although the physiologists of the past have given us an abundance of conclusions, these have been modified and amplified by recent investigators, yielding a multitude of facts. A thorough comprehension of these is a prerequisite for correct explanation of the many varied clinical manifestations."

The first portion of the book is devoted to the anatomy and histology of the blood-vessels, the anatomy and physiology of the nerves controlling these vessels, a consideration of circulation both normal and abnormal, a study of the causes and effects of thrombosis, a consideration of gangrene with the end result of vascular occlusion, and with an exposition of the clinical course of diseases incident to circulatory disturbance. The author dwells particularly upon the pathological and diagnostic phases of the abnormalities he describes.

Since practically all diseases are traceable to circulatory changes they must be cured, if they be curable, by restoration of the normal flow of blood through its vessels. Buerger's work may be considered as an exposition, and an admirable exposition, of the fundamentals in surgery of the extremities, and as such cannot be praised too highly.

OPERATIVE SURGERY. By Warren Stone Bickham, M.D., Phar.M., M.D. Columbia, F.A.C.S. Illustrated. Volume IV. W. B. Saunders Company, Philadelphia and London, 1924.

The high standard set by the preceding three volumes of Operative Surgery are well maintained in this fourth volume, which is devoted to Intrathoracic Surgery, including the Heart and Esophagus, Operations on the Abdomino-Pelvic Walls, the Surgical Treatment of Hernia, Operations upon the Peritoneum and Intra-Abdominal Surgery, with a final chapter upon the Appendicocecal Tract.

Again the text is abundantly and beautifully illustrated, and in such helpful detail it enables the student to more intelligently apply the teachings of the written word.

A brief but adequate surgical anatomy of each part precedes the operative description. Under the heading Operations on the Pericardium follow the subtitles Surgical Anatomy of the Pericardium—Surface Form and Landmarks; Pericardiocentesis, or Paracentesis Pericardii; Pericardiotomy, in General; Pericardiotomy by Various Routes and Methods, and Pericardiorrhaphy, Pericardio-Lysis for Pericardio-symphysis.

The operative treatment of wounds of the heart is described, and the method of direct massage, with a discussion of its physiology.

Trendelenburg's operation for embolism of the pulmonary arteries is given in full and is illustrated.

There is a brief description of the approach to the esophagus through the chest wall, and a condensed, but useful, description of the exposure of the liver through the thoracic wall.

The operation of resection of the cardiac end of the stomach by the transthoracic route is described and pictured.

Bearing on Operations on the Adomino-Pelvic Wall and following the anatomical description and surface landmarks, there is an excellent general consideration of the subject, followed by various operative procedures, the first illustrated being partial excision of a redundantly fat abdominal wall.

The various approaches to the abdominal contents and the method of suture are given in full. This to the general surgeon should be one of the most useful portions of the book. The section on Hernia is particularly full. The space devoted to Surgery of the Liver and its Ducts is justified by the refinement to which this branch of operative work has been brought.

No surgeon can look over any of these volumes without a humbling concept of his unfamiliarity with the varying methods of accomplishing a given result and without a sense of grateful appreciation for one who has so widely traversed medical literature and clinical experience, and given him not only in minute detail the best and approved surgical technique, but offered him a choice, often a number of choices, any one of which may be applicable to special conditions.

Notes and Queries

Correction as to Neo-Silvol.

In an article quoted from the *Journal of Laboratory and Clinical Medicine* for January, 1924, which appeared in the THERAPEUTIC GAZETTE for July, it is stated that neo-silvol is a colloidal silver chloride stabilized by using a proteid. The manufacturers state this is an error and that it is a colloidal silver *iodide*, not chloride.